

SS100-AK-MMA-010

TECHNICAL MANUAL
OPERATION AND MAINTENANCE MANUAL
ORGANIZATIONAL AND INTERMEDIATE LEVELS
BREATHING AIR REDUCING STATION (BARS)

0910-LP-028-7760

N61331-97-D-0024



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
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Changes to the Breathing Air Reducing Station (BARS) Operation and Maintenance Manual, SS100-AK-MMA-010, require Naval Sea Systems Command (NAVSEA) review and approval.

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FOREWORD

This technical manual contains procedures for operation and maintenance of the Breathing Air Reducing Station (BARS). The information in this manual is presented in eight chapters, as follows:

- Chapter 1—General Information and Safety Precautions
- Chapter 2—Operation
- Chapter 3—Functional Description
- Chapter 4—Scheduled Maintenance
- Chapter 5—Troubleshooting
- Chapter 6—Corrective Maintenance
- Chapter 7—Illustrated Parts Breakdown
- Chapter 8—Installation

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LIST OF ACRONYMS AND ABBREVIATIONS

3-M	Maintenance Material Management
BAC	Breathing Air Compressor
BARS.....	Breathing Air Reducing Station
CAGE	Commercial And Government Entity
CCW	Counterclockwise
CW	Clockwise
DCPO	Damage Control Petty Officer
e.g.	<i>exempli gratia</i> (for example)
HP	High Pressure
IAW	In Accordance With
IDLH	Immediately Dangerous to Life and Health
IMA	Intermediate Maintenance Activity
IPB.....	Illustrated Parts Breakdown
ISEA	In-Service Engineering Agent
MDS	Maintenance Data System
MIP	Maintenance Index Page
MRC	Maintenance Requirement Card
N/A	Not Applicable or Not Available
NAVOSH	Navy Occupational Safety and Health
NID	Nonionic Detergent
NOC	Navy Oxygen Cleaner
NSN.....	National Stock Number
PLAD	Plain Language Address Directory
PMS.....	Planned Maintenance System
psig.....	Pounds per Square Inch Gauge
SAR/SCBA	Supplied Air Respirator with Self-Contained Breathing Apparatus
scfm.....	Standard Cubic Feet per Minute
SEED.....	Supplemental Emergency Egress Device
SPMIG.....	Standard PMS Materials Identification Guide
TSP	Trisodium Phosphate or Tribasic Sodium Phosphate

SAFETY SUMMARY

The following safety guidelines apply to operation and maintenance procedures in general. Personnel must understand and comply with these guidelines during operation and maintenance of the Breathing Air Reducing Station (BARS).

STANDARD SAFETY PRECAUTIONS

Operating and maintenance personnel must observe all applicable regulations and standard precautions. Only approved replacement parts, lubricants, and cleaning solutions specified in this technical manual shall be used with this equipment. Practices such as substitution of parts or materials and omission or alteration of prescribed procedures are not authorized.

FORCES AFLOAT

Forces afloat must also comply with the *Navy Occupational Safety and Health (NAVOSH) Program Manual for Forces Afloat*, OPNAVINST 5100.19 series.

SHORE ACTIVITIES

Shore activities must also comply with the *Navy Occupational Safety and Health Program Manual*, OPNAVINST 5100.23 series.

WARNINGS

The following warnings appear in the text of this manual and are repeated here for emphasis.

WARNING

Prior to bleeding pressure from hoses, ensure all personnel are standing clear of area to avoid injury from flying debris. Operator shall announce "Bleeding down" to warn nearby personnel. Operator must wear hearing and eye protection to prevent injury. (Pages 2-5, 2-6, 2-8, 2-9, and 6-5)

SCBA cylinders that show evidence of exposure to high heat or flame (e.g., paint turned brown or black color, decals charred or missing, gauge lens melted, or elastomeric materials distorted) shall be removed from service and hydrostatically tested prior to recharging. Failure to observe this warning could result in serious injury or death. (Page 2-7)

Properly performed scheduled maintenance is essential to safe and dependable operation of the Breathing Air Reducing Station (BARS). Omission or negligent performance of prescribed maintenance procedures for this equipment could result in equipment failure and injury or death to personnel. (Page 4-1)

If in doubt about the serviceability of a part, replace it immediately. Worn or damaged parts shall be replaced with authorized replacement parts only. Component failure during operations may result in serious injury or death. (Pages 4-2 and 6-1)

SAFETY SUMMARY—Continued**WARNING**

DO NOT DISASSEMBLE COMPONENTS NOR LOOSEN OR TIGHTEN FITTINGS WHILE THE SYSTEM IS PRESSURIZED. Prior to performing maintenance, ensure HP air supply has been shut down and all pressure has been vented from the system. Exposure to escaping HP air may result in serious injury or death to personnel. (Pages 4-2 and 6-2)

Do not use Trisodium Phosphate (TSP) to clean aluminum components. Use may result in equipment failure and personnel injury or death. (Pages 4-2 and 6-2)

Cleanliness is imperative in handling and maintaining the BARS. All tools and parts must be kept free of oil, grease, rust, or other contamination. Contamination of the breathing air system could result in serious injury or death to personnel breathing the contaminated air. (Pages 4-3 and 6-2)

Ensure O-rings are in good condition before installation. Failure of an O-ring could cause damage to equipment and injury or death to personnel. (Pages 4-3 and 6-2)

Properly performed corrective maintenance is essential to safe and dependable operation of the Breathing Air Reducing Station (BARS). Omission or negligent performance of prescribed maintenance procedures for this equipment could result in equipment failure and injury or death to personnel. (Page 6-1)

Ensure proper tag-out procedures are performed prior to conducting maintenance. Failure to comply may result in injury or death to personnel. (Page 6-2)

Ensure approved hearing and eye protection is worn when conducting this test. Failure to use protective equipment could result in injury or death. (Pages 6-4)

DO NOT LOOSEN OR TIGHTEN FITTINGS WHILE THE SYSTEM IS UNDER PRESSURE. Failure to comply could result in injury or death to personnel and damage to equipment. (Page 6-5)

Before conducting maintenance on the BARS, ensure all pressure has been bled from the system. Failure to comply could result in injury or death to personnel. (Pages 6-5, 6-7, and 6-10)

CAUTIONS

The following caution appears in the text of this manual and is repeated here for emphasis.

CAUTION

To prevent damage to gauges, use two wrenches when tightening or loosening tubing assemblies. (Pages 6-6, 6-7, and 6-9)

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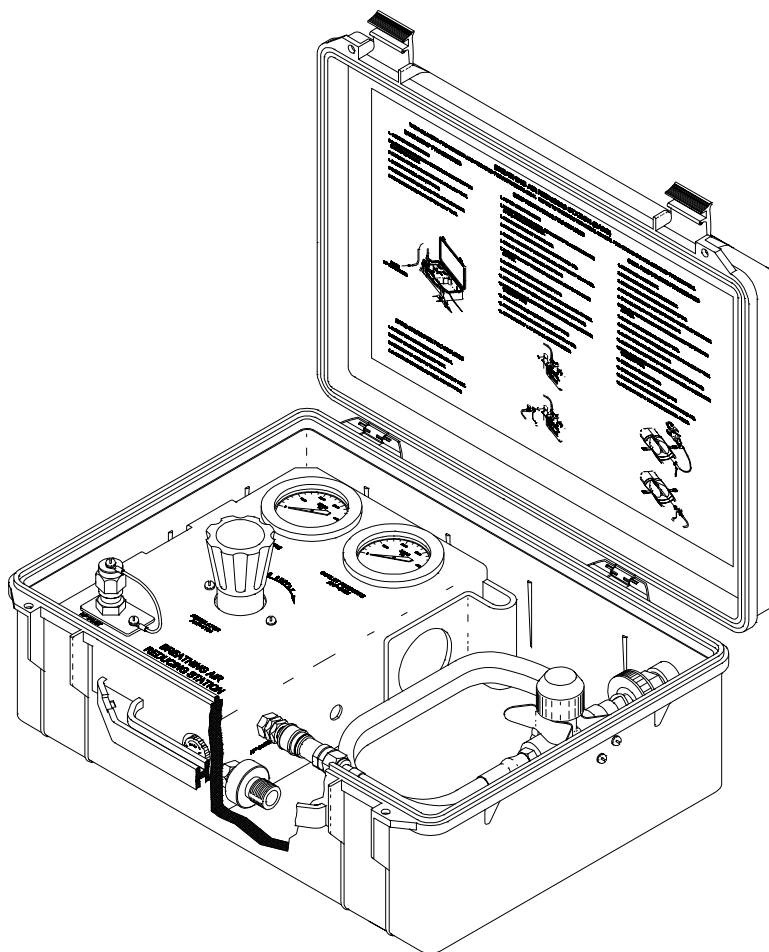


Figure 1-1. Breathing Air Reducing Station (BARS)

CHAPTER 1

GENERAL INFORMATION AND SAFETY PRECAUTIONS

1.1 SAFETY PRECAUTIONS

Standard United States Navy safety procedures shall be observed while operating the Breathing Air Reducing Station (BARS). Personnel using the BARS shall comply with the safety instructions listed in paragraph 1.1.1 and with the safety precautions presented in this manual.

1.1.1 General Safety Instructions. The following documents contain standard operational and maintenance safety precautions that shall be observed while operating the BARS:

- Forces afloat must comply with the *Navy Occupational Safety and Health (NAV-OSH) Program Manual for Forces Afloat*, OPNAVINST 5100.19 series.
- Shore activities must comply with the *Navy Occupational Safety and Health Program Manual*, OPNAVINST 5100.23 series.

1.1.2 Special Precautions. The warnings, cautions, and notes appearing throughout this technical manual must be followed to prevent hazards to personnel and damage to the equipment. The following notations define warnings, cautions, and notes as they are used in the text of this manual:

WARNING

An operating or maintenance procedure, practice, condition, or statement, which if not strictly observed could result in injury or death of personnel.

CAUTION

An operating or maintenance procedure, practice, condition, or statement, which if not strictly observed could result in damage to or destruction of equipment, loss of operational effectiveness, or long-term health hazards to personnel.

NOTE

An operating or maintenance procedure, practice, condition, or statement that is essential but not of a known hazardous nature.

1.2 INTRODUCTION

1.2.1 Purpose. The purpose of this manual is to provide the information and procedures necessary to operate, maintain, troubleshoot, and restore the BARS to an operable condition. Maintenance actions at the Organizational and Intermediate levels are included in this manual.

1.2.2 Scope. The information presented in this manual is presented in eight chapters, as follows:

- Chapter 1, *General Information and Safety Precautions*, introduces safety considerations and presents a system description, reference data and publications, and a list of the equipment, accessories, and documents supplied with each system.
- Chapter 2, *Operation*, provides the operating instructions necessary to enable personnel to effectively use the equipment.
- Chapter 3, *Functional Description*, provides a complete system description and functional descriptions of the individual components comprising the BARS.
- Chapter 4, *Scheduled Maintenance*, provides a reference to the Planned Maintenance System (PMS) for the BARS and contains general maintenance instructions.
- Chapter 5, *Troubleshooting*, contains procedures for locating malfunctions or potential faults and for identifying possible corrective actions.

- Chapter 6, *Corrective Maintenance*, provides instructions for inspecting, adjusting, and testing the BARS, and for removing and replacing damaged or defective components. Safety precautions, tools, and consumable supplies are also identified.
- Chapter 7, *Illustrated Parts Breakdown*, contains exploded views of BARS components and corresponding parts lists. A list of part manufacturers and suppliers is also provided.
- Chapter 8, *Installation*, provides the initial unpacking, inventory, inspection, storage, and shipping procedures.

1.3 SYSTEM DESCRIPTION

The BARS (Figure 1-1) is a portable air reducing station that is completely self-contained in a hard-shell carrying case. The BARS is used to recharge the Immediately Dangerous to Life and Health (IDLH) Supplied Air Respirator with Self-Contained Breathing Apparatus (SAR/SCBA) back-up air cylinders (Figure 1-2) and the Supplemental Emergency Egress Device (SEED) bottles (Figure 1-3). The BARS consists of a charging hose assembly, a charging adapter and a mounting bracket used in recharging SEED bottles, and a panel assembly containing a regulator, relief valve, inlet and outlet pressure gauges, and high-pressure (HP) inlet and outlet ports.

NOTE

For the remainder of this manual, the SAR/SCBA back-up air cylinders will be referred to as the SCBA cylinders, and the charging hose assembly will be referred to as the BARS hose assembly to differentiate between it and the hose supplied with the external HP air supply.

The HP air supply is provided by an external source, such as the Breathing Air Compressor (BAC), which connects to the BARS HP inlet connection on the lower left-hand side of the panel assembly. As HP air enters the station, it is manually regulated to $3,000 \pm 50$ pounds per square inch gauge (psig) and charges the SCBA

cylinders at a rate of 12.2 standard cubic feet per minute (scfm) and SEED bottles at a rate of 2.0 scfm. The SCBA cylinders are connected directly to the BARS hose assembly for recharging. The SEED bottle, however, must be connected to the BARS hose assembly using the charging adapter. The SEED bottle is then placed in the mounting bracket for recharging. A combination isolation/ bleed valve on the BARS hose assembly allows multiple SCBA cylinders or SEED bottles to be recharged without full station shutdown. Gauges on the BARS panel assembly are used to monitor the recharging process. Recharging procedures are provided in Chapter 2 of this manual and are also mounted inside the lid of the carrying case.

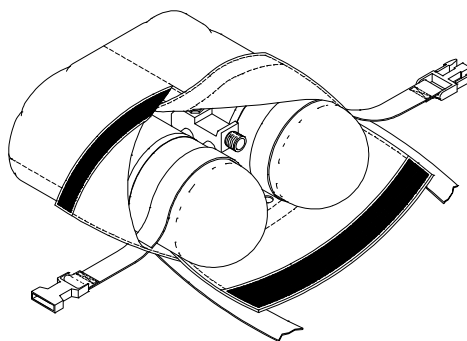


Figure 1-2. SAR/SCBA Back-Up Air Cylinders

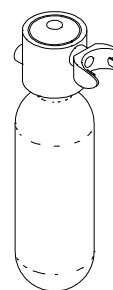


Figure 1-3. SEED Bottle

1.4 REFERENCE DATA

Table 1-1 lists physical and functional characteristics of the BARS.

Table 1-1. Physical and Functional Characteristics

Item	Value
Weight	19 pounds
Dimensions of carrying case	19.25 in. x 15.5 in. x 7.5 in.
Maximum inlet service pressure	5,000 psig
External HP air supply	3,000 to 5,000 psig
Maximum desired BARS outlet pressure	3,000 \pm 50 psig
Relief valve setpoint	3,300 \pm 50 psig
Charging rate for SCBA cylinders	12.2 scfm
Charging rate for SEED bottle	2.0 scfm

1.5 EQUIPMENT, ACCESSORIES, AND DOCUMENTS SUPPLIED

Table 1-2 lists the equipment, accessories, and documents supplied with each system.

1.6 REFERENCE PUBLICATIONS

Table 1-3 lists the publications that are required to safely operate the BARS but are not supplied with the equipment.

Table 1-2. Equipment, Accessories, and Documents Supplied

Item	Quantity	Reference Number
Breathing Air Reducing Station, consisting of: 1 Hose Assembly 1 Panel Assembly 1 Charging Adapter 1 Mounting Bracket 1 Carrying Case	1	53711-6314781 53711-6314782-1 53711-6314783-1 53711-6314788-2 53711-6314785 53711-6314784-1
Breathing Air Reducing Station (BARS) Operation and Maintenance Manual	1	SS100-AK-MMA-010
Interim Maintenance Requirement Cards (MRCs) for the Breathing Air Reducing Station (BARS)	1	Indexed and referenced on MIP 6641/004

Table 1-3. Reference Publications Not Supplied

Publication Title	Publication Number
Cleaning of Shipboard Compressed Air Systems	MIL-STD-1622
Commodity Specification for Air, Compressed Gas Association, Inc.	CGA G-7.1-1989
Navy Occupational Safety and Health (NAVOSH) Program Manual for Forces Afloat	OPNAVINST 5100.19 Series
Navy Occupational Safety and Health Program Manual	OPNAVINST 5100.23 Series
Ships Maintenance Action Form	OPNAV 4790/2K
Ships' Maintenance Material Management (3-M) Manual	OPNAVINST 4790.4 Series
Supplemental Emergency Egress Device (SEED) Operation and Maintenance Instructions	NAVSEA SS600-A4-MMA-010/49537
Supplementary Emergency Egress Device (SEED) Maintenance Requirement Card (MRC) S-1R	Indexed and referenced on MIP 6641/017
Supplied Air Respirator (SAR) With Self-Contained Breathing Apparatus (SCBA) Operation and Maintenance Instructions	NAVSEA SS600-AN-MMA-010
Supplied Air Respirator/Self-Contained Breathing Apparatus (SAR/SCBA) Maintenance Requirement Cards (MRCs) M-1R and Q-2R	Indexed and referenced on MIP 5519/015

CHAPTER 2

OPERATION

2.1 INTRODUCTION

This chapter provides equipment operating procedures for the Breathing Air Reducing Station (BARS) in the sequence of an actual operation, beginning with pre-operational inspection and setup procedures and ending with post-operational procedures. Figure 2-1 illustrates the general sequence of the operational procedures for the BARS.

2.2 CONTROLS AND INDICATORS

Controls and indicators for the BARS are identified and functionally described in Table 2-1 and illustrated in Figures 2-2 and 2-3.

2.3 OPERATING PROCEDURES

2.3.1 Pre-Operational Inspection and Setup Procedures. Table 2-2 provides inspection and setup procedures for the BARS.

2.3.2 Operating and Shutdown Procedures.

Table 2-3 provides detailed operating procedures for using the BARS to charge the Supplemental Emergency Egress Device (SEED) bottles, and Table 2-4 provides the procedures for using the BARS to charge the Supplied Air Respirator with Self-Contained Breathing Apparatus (SAR/SCBA) back-up air cylinders (SCBA cylinders). Interim and final shutdown procedures are also included in Tables 2-3 and 2-4. The interim shutdown procedures allow bottle/cylinder change-out for multiple recharging requirements without having to effect a total station shutdown, whereas the final shutdown procedures bring the equipment to a total shutdown for storage or maintenance. Detailed information on using and maintaining SEED bottles and SCBA cylinders is provided in NAVSEA SS600-A4-MMA-010/49537 and NAVSEA SS600-AN-MMA-010, respectively.

2.3.3 Post-Operational Procedures. Table 2-5 provides general post-operational procedures for the BARS.

NOTE

The step numbers in Tables 2-2 through 2-4 correspond to those shown in the lid instructions inside the BARS carrying case. The procedures in this chapter explain the lid instructions in more detail.

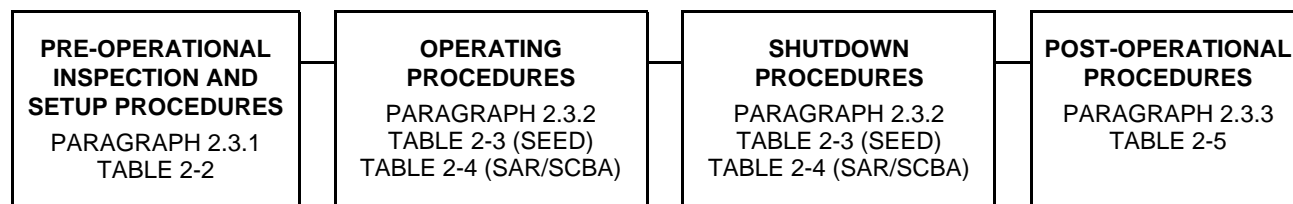


Figure 2-1. Operational Procedures Flowchart

Table 2-1. Controls and Indicators
 (Component designations correspond to Figure 2-2,
 and index numbers correspond to call-outs in Figure 2-3)

Index No.	Equipment Label	Description	Normal Operating Position
1	OUTLET PRESSURE AHP-G102	Pressure gauge; indicates pressure of high-pressure (HP) air available for charging (0-5,000 pounds per square inch gauge (psig)).	3,000 ± 50 psig
2	INLET PRESSURE AHP-G101	Pressure gauge; indicates pressure of HP air delivered by external air supply (0-5,000 psig).	Variable
3	REGULATOR AHP-V101	Regulator; reduces HP air from maximum of 5,000 psig to 3,000 ± 50 psig for charging.	Variable
4	N/A	Shutoff knob for BARS hose assembly isolation/ bleed valve (AHP-V103); controls flow of charging air to SEED bottle or SCBA cylinders. Allows for multiple recharging without system shutdown.	Open/Shut
5	N/A	Bleed handle for BARS hose assembly isolation/ bleed valve (AHP-V103); bleeds air pressure from connection between bottles or cylinders and BARS hose assembly (H-101) prior to change-out.	Open/Shut

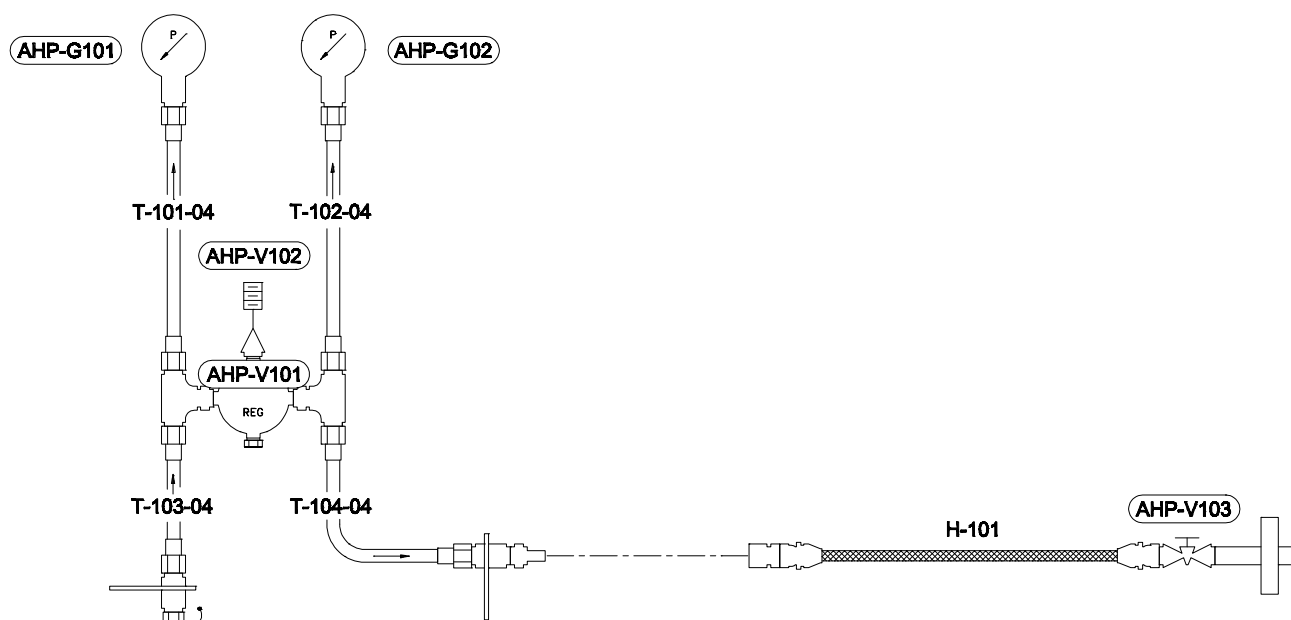


Figure 2-2. Control/Indicator Designations

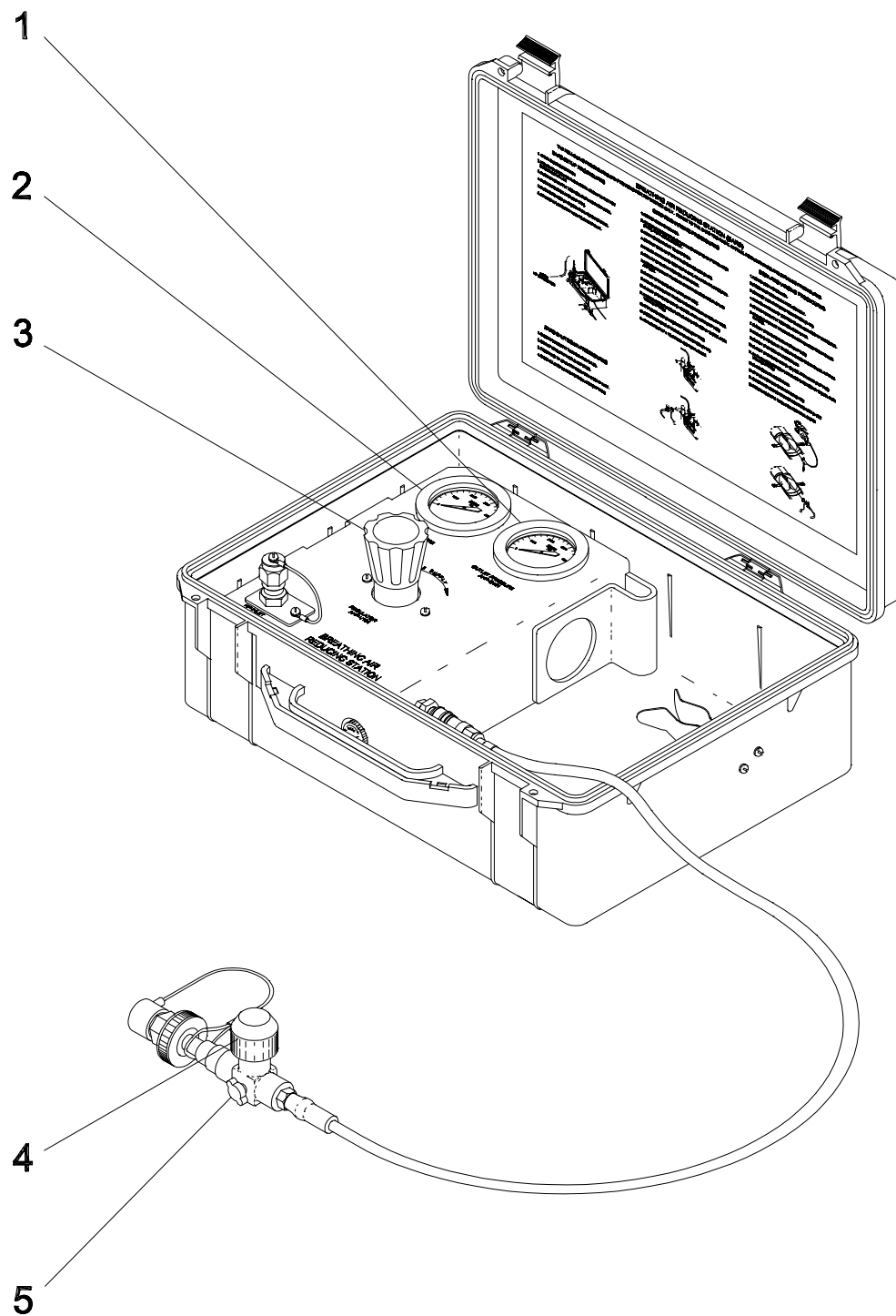


Figure 2-3. Controls and Indicators

Table 2-2. Pre-Operational Inspection and Setup Procedures
(Refer to Figure 2-4 for component locations)

Step	Procedure
1	Perform the following inspections: a. Verify that gauge calibration stickers reflect calibration dates within 18-month periodicity. Do not operate equipment if calibration dates are not current. b. Inspect REGULATOR (AHP-V101) and other components for damage.
2	Check air source maintenance log to ensure external HP air supply has passed air sample test conducted within last 3 months and provides air of life support quality (Grade D or better as defined by CGA G-7.1-1989).
3	Ensure BARS REGULATOR (AHP-V101) is closed fully counterclockwise (CCW).
4	Remove BARS hose assembly (H-101) from storage clip and attach to HP OUTLET connection on BARS panel assembly.
5	Ensure shutoff knob and bleed handle on BARS hose assembly isolation/bleed valve (AHP-V103) are both closed fully clockwise (CW).
6	Set up external HP air supply in accordance with approved operating procedures. Connect external HP air supply hose to HP INLET connection on BARS panel assembly.
7	Ensure a minimum pressure of 3,000 psig is available from HP air supply.
8	Open external HP air supply isolation valve(s). Ensure bleed valve remains closed.
9	Adjust REGULATOR (AHP-V101) slowly CW until OUTLET PRESSURE gauge (AHP-G102) reads 3,000 psig.
<p align="center">THE EQUIPMENT IS NOW IN STANDBY CONDITION. PROCEED TO TABLE 2-3 (SEED) OR TABLE 2-4 (SAR/SCBA).</p>	

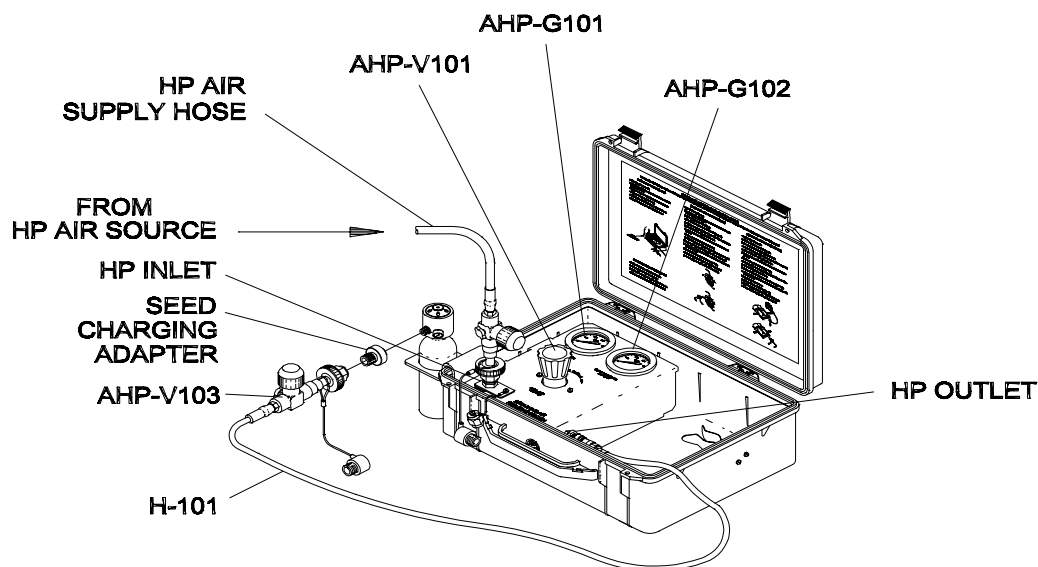


Figure 2-4. Equipment Setup (Shown with SEED Bottle)

Table 2-3. Operating and Shutdown Procedures for Charging SEED Bottles
(Refer to Figure 2-4 for component locations)

Step	Procedure
OPERATING PROCEDURE	
1	Remove mounting bracket from BARS carrying case. Attach bracket to side of case as shown in Figure 2-4.
2	Inspect SEED in accordance with Maintenance Requirement Card (MRC) S-1R, which is indexed on Maintenance Index Page (MIP) 6641/017. Remove SEED from holster.
3	Connect charging adapter to SEED as follows: a. Remove charging adapter from storage position in BARS carrying case. Remove orange thread protector. b. Remove cap from charging port on SEED bottle. Attach and hand-tighten charging adapter to SEED connection point.
4	Remove protective cap from BARS hose assembly (H-101), and attach hose assembly to SEED charging adapter. Insert SEED bottle into mounting bracket on case.
5	Ensure INLET PRESSURE gauge (AHP-G101) reads a minimum of 3,000 psig and a maximum of 5,000 psig. Slowly turn shutoff knob on BARS hose assembly isolation/bleed valve (AHP-V103) fully CCW. Air should be heard flowing to SEED bottle.
6	Monitor OUTLET PRESSURE gauge (AHP-G102). Pressure should climb as SEED bottle charges. SEED bottle is filled when OUTLET PRESSURE gauge (AHP-G102) reads 3,000 psig and no airflow can be heard. When charging is complete, turn shutoff knob on BARS hose assembly isolation/bleed valve (AHP-V103) fully CW.
INTERIM SHUTDOWN PROCEDURE	
<div style="text-align: center; border: 1px solid black; padding: 5px; margin-bottom: 10px;">WARNING</div> <p>Prior to bleeding pressure from hoses, ensure all personnel are standing clear of area to avoid injury from flying debris. Operator shall announce “Bleeding down” to warn nearby personnel. Operator must wear hearing and eye protection to prevent injury.</p>	
7	Bleed down (vent) pressure to SEED bottle by turning bleed handle on BARS hose assembly isolation/bleed valve (AHP-V103) fully CCW. Keep valve open until no airflow can be heard. Close bleed handle fully CW.
8	Disconnect BARS hose assembly (H-101) from SEED charging adapter by turning nut CCW by hand. Place protective cap on hose assembly.
9	Disconnect charging adapter from SEED bottle by turning adapter CCW, and prepare SEED for use as follows: a. Replace cap on charging port of SEED bottle. b. Ensure mouthpiece cover is in place. c. Reinstall SEED bottle in holster.
10	If charging additional SEED bottles, repeat steps 2 through 9 until all bottles have been filled. If charging is complete, return charging adapter to storage position, install thread protector, and continue with final shutdown procedure.

Table 2-3. Operating and Shutdown Procedures for Charging SEED Bottles—Continued

Step	Procedure
FINAL SHUTDOWN PROCEDURE	
1	Secure external HP air supply in accordance with approved operating procedures.
2	<div data-bbox="699 443 911 516" style="border: 3px double black; padding: 5px; text-align: center; margin: 10px auto; width: 100px;"> WARNING </div> <p data-bbox="323 552 1349 688">Prior to bleeding pressure from hoses, ensure all personnel are standing clear of area to avoid injury from flying debris. Operator shall announce “Bleeding down” to warn nearby personnel. Operator must wear hearing and eye protection to prevent injury.</p> <p data-bbox="253 703 1382 800">Open bleed valve on external HP air supply hose and bleed air from system until INLET and OUTLET PRESSURE gauges (AHP-G101 and AHP-G102) both read 0 psig. Close bleed valve.</p>
3	Disconnect external HP air supply hose from HP INLET and BARS hose assembly (H-101) from HP OUTLET.
4	Back off REGULATOR (AHP-V101) fully CCW. Reinstall protective covers on hoses and HP INLET and HP OUTLET connections. Stow mounting bracket and BARS hose assembly (H-101) in case.
ALL EQUIPMENT IS SHUT DOWN AT THIS POINT. PROCEED TO TABLE 2-5.	

Table 2-4. Operating and Shutdown Procedures for Charging SCBA Cylinders
(Refer to Figure 2-5 for component locations)

Step	Procedure
OPERATING PROCEDURE	
1	<div style="border: 1px solid black; padding: 5px; text-align: center;">WARNING</div> <p>SCBA cylinders that show evidence of exposure to high heat or flame (e.g., paint turned brown or black color, decals charred or missing, gauge lens melted, or elastomeric materials distorted) shall be removed from service and hydrostatically tested prior to recharging. Failure to observe this warning could result in serious injury or death.</p>
	<p>a. Inspect external surfaces of SCBA cylinders for damage in accordance with MRC Q-2R (MIP 5519/015). Check hydrostatic test date.</p> <p>b. Prepare SCBA cylinders for charging as follows:</p> <ol style="list-style-type: none"> (1) Ensure SCBA cylinder valve is shut and mask-mounted regulator semiautomatic push button (DON/DOFF) has been placed in DOFF position to vent SCBA cylinder low-pressure air circuit. Disconnect SCBA cylinder from external air supply. (2) Stabilize SCBA cylinders in a rack or on a table top. (3) Open Velcro® closures on SAR/SCBA pouch and fold down two back flaps to expose first-stage regulator.
2	Disconnect first-stage regulator. Loosen CGA-346 nut by hand, or if necessary, use 1-1/8 inch open-end wrench.

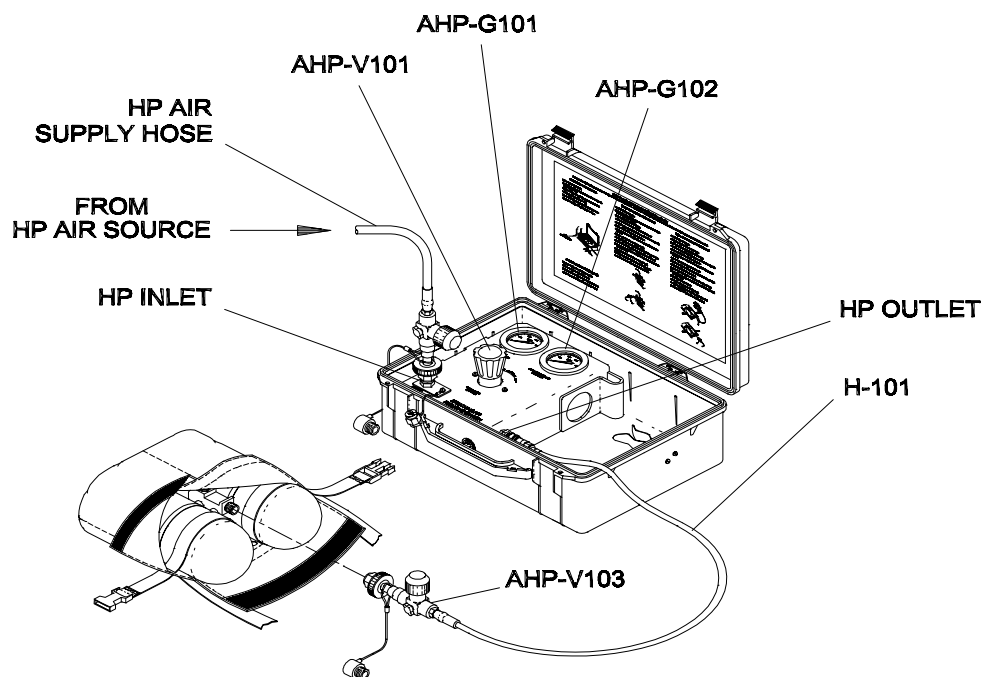


Figure 2-5. Equipment Setup (Shown with SCBA Cylinders)

Table 2-4. Operating and Shutdown Procedures for Charging SCBA Cylinders—Cont.

Step	Procedure
OPERATING PROCEDURE—Continued	
3	Remove protective cap from BARS hose assembly (H-101) and attach CGA-346 nut to SCBA cylinder valve connection.
4	Slowly open SCBA cylinder valve (reverse side of pouch).
5	Slowly turn shutoff knob on BARS hose assembly isolation/bleed valve (AHP-V103) fully CCW. Air should be heard flowing to SCBA cylinders.
6	Monitor OUTLET PRESSURE gauge (AHP-G102). Pressure should climb as SCBA cylinder charges. Cylinder is filled when OUTLET PRESSURE gauge (AHP-G102) reads 3,000 psig and no airflow can be heard. When charging is complete, turn shutoff knob on BARS hose assembly isolation/bleed valve (AHP-V103) fully CW.
7	Close SCBA cylinder valve (reverse side of pouch).
INTERIM SHUTDOWN PROCEDURE	
<div style="text-align: center; border: 1px solid black; padding: 5px; margin: 10px auto; width: 150px;"> WARNING </div> <p>Prior to bleeding pressure from hoses, ensure all personnel are standing clear of area to avoid injury from flying debris. Operator shall announce “Bleeding down” to warn nearby personnel. Operator must wear hearing and eye protection to prevent injury.</p>	
8	Bleed down (vent) pressure to cylinders by turning bleed handle on BARS hose assembly isolation/bleed valve (AHP-V103) fully CCW. Keep valve open until no airflow can be heard. Close bleed handle fully CW.
9	a. Disconnect BARS hose assembly (H-101) from SCBA cylinder valve connection by turning handwheel CCW by hand. b. Prepare SCBA cylinders for use as follows: <ol style="list-style-type: none"> (1) Allow SCBA cylinders to cool 2-4 hours, then recheck cylinder valve pressure indicator. If cylinder pressure falls below 3,000 psig, repeat steps 3 through 9a. (2) Carefully reinstall first-stage regulator to cylinder valve connection. (3) Leak test cylinder connections in accordance with Maintenance Requirement 3, Step c on MRC M-1R (MIP 5519/015). (4) Close pouch using Velcro® closures. Ensure pressure indicator, alarm, and cylinder valve protrude through rubber access holes in pouch. Return cylinders to service or to storage container.
10	If charging additional SCBA cylinders, repeat steps 1 through 9 until all cylinders have been filled. If charging is complete, continue with final shutdown procedure.

CONTINUED NEXT PAGE

Table 2-4. Operating and Shutdown Procedures for Charging SCBA Cylinders—Cont.

Step	Procedure
FINAL SHUTDOWN PROCEDURE	
1	Secure external HP air supply in accordance with approved operating procedures.
	<div style="border: 1px solid black; padding: 5px; text-align: center;">WARNING</div> <p>Prior to bleeding pressure from hoses, ensure all personnel are standing clear of area to avoid injury from flying debris. Operator shall announce “Bleeding down” to warn nearby personnel. Operator must wear hearing and eye protection to prevent injury.</p>
2	Open bleed valve on external HP air supply hose and bleed air from system until INLET and OUTLET PRESSURE gauges (AHP-G101 and AHP-G102) both read 0 psig. Close bleed valve.
3	Disconnect external HP air supply hose from HP INLET and BARS hose assembly (H-101) from HP OUTLET.
4	Back off REGULATOR (AHP-V101) fully CCW. Reinstall protective covers on hoses and HP INLET and HP OUTLET connections. Stow BARS hose assembly (H-101) in case.
ALL EQUIPMENT IS SHUT DOWN AT THIS POINT. PROCEED TO TABLE 2-5.	

Table 2-5. Post-Operational Procedures

Step	Procedure
1	If equipment was exposed to salt air environment or dirt, wipe down with fresh water.
2	Inspect equipment for damage, such as cracks, dents, and abrasions.
3	Ensure all equipment is clean and dry prior to closing carrying case. Close case and store in a cool location away from heat source or flammable materials.

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CHAPTER 3

FUNCTIONAL DESCRIPTION

3.1 INTRODUCTION

This chapter provides a functional description of the Breathing Air Reducing Station (BARS) and its interrelationship with the Supplied Air Respirator with Self-Contained Breathing Apparatus (SAR/SCBA) and the Supplemental Emergency Egress Device (SEED).

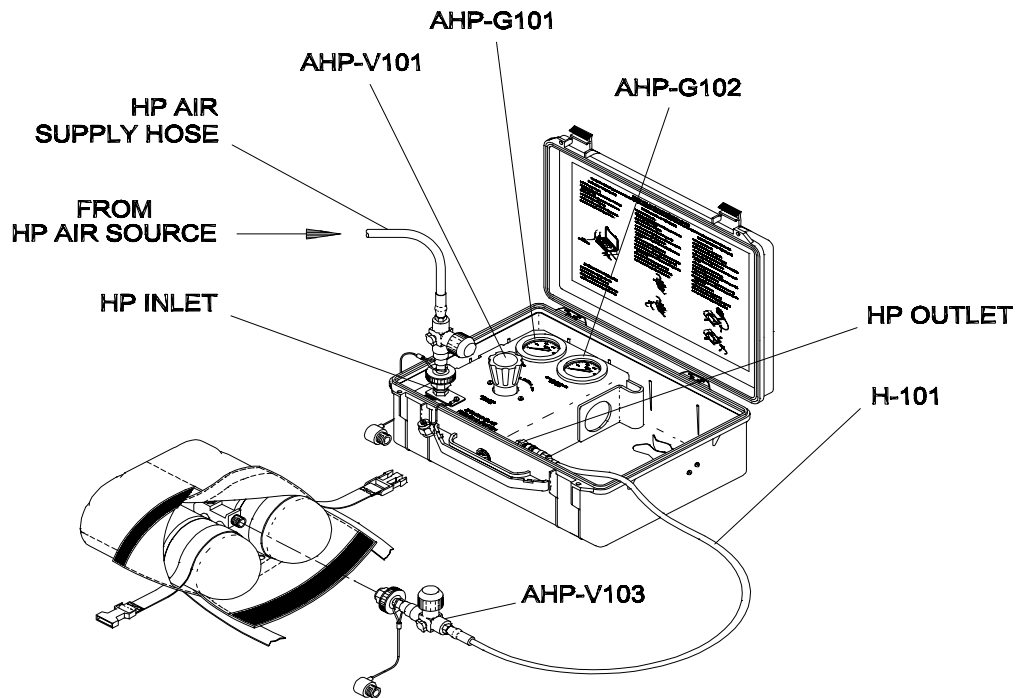
3.2 SYSTEM DESCRIPTION

The BARS is a portable air reducing station that is completely self-contained in a hard-shell carrying case. The BARS recharges the Immediately Dangerous to Life and Health (IDLH) SAR/SCBA back-up air cylinders (SCBA cylinders) and SEED bottles. Figure 3-1 identifies the major components of the BARS and their interrelationships with the SAR/SCBA and SEED, and Figure 3-2 provides a functional block diagram of the BARS. The BARS consists of a charging hose assembly (BARS hose assembly), a charging adapter and a mounting bracket used in recharging SEED bottles, and a panel assembly containing a regulator, relief valve, inlet and outlet pressure gauges, and high-pressure (HP) inlet and outlet ports. The HP air supply is provided by an external source, such as the Breathing Air Compressor (BAC), which connects to the BARS HP inlet connection on the lower left-hand side of the panel assembly. As HP air enters the station, it is manually regulated to $3,000 \pm 50$ pounds per square inch gauge (psig) and charges the SCBA cylinders at a rate of 12.2 standard cubic feet per minute (scfm) and SEED bottles at a rate of 2.0 scfm. The SCBA cylinders are connected directly to the BARS hose assembly for recharging, but the SEED bottle must be connected to the BARS hose assembly using the charging adapter. The SEED bottle is then placed in the mounting bracket for recharging. A combination isolation/bleed valve on the BARS hose assembly allows multiple SEED bottles or SCBA cylinders to be recharged without full station shutdown. Gauges on the BARS panel assembly are used to monitor the recharging

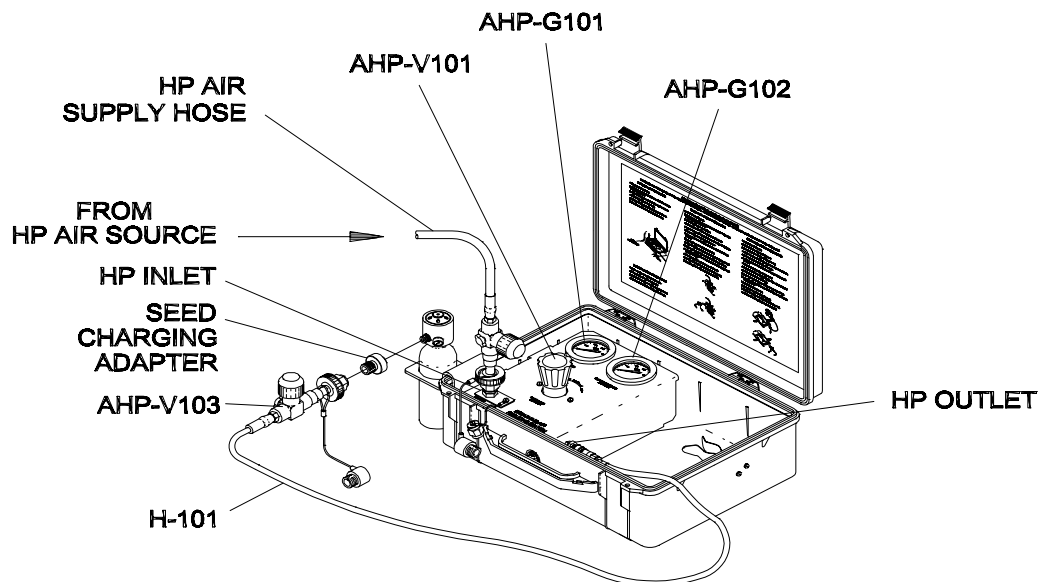
process. Recharging procedures are provided in Chapter 2 of this manual and are also mounted inside the lid of the carrying case.

3.2.1 BARS Panel Assembly. The BARS panel assembly houses the regulator, pressure gauges, relief valve, and HP inlet and outlet ports. The regulator (AHP-V101) is a manually controlled pressure reducer that reduces HP air pressure from a maximum of 5,000 psig down to 3,000 psig. The inlet and outlet pressure gauges (AHP-G101 and AHP-G102) display air pressure readings from 0-6,000 psig. An automatic relief valve (AHP-V102), located behind the panel, releases pressure should the regulator fail and the outlet pressure exceed $3,300 \pm 50$ psig. The HP inlet port is a CGA-346 female fitting that permits connection of an HP air supply hose, and the HP outlet port permits connection of the BARS hose assembly (H-101).

3.2.2 BARS Hose Assembly. The BARS hose assembly (H-101) delivers HP air from the panel assembly to the SAR/SCBA or SEED. The hose assembly consists of a thermal plastic hose with stainless steel jacketing, a quick disconnect socket for connection to the BARS HP outlet port, an isolation/bleed valve, and a CGA-346 fitting. The CGA-346 fitting attaches directly to the SCBA cylinders or indirectly to the SEED bottle using the charging adapter. The combination isolation/bleed valve (AHP-V103) controls the flow of HP air to the SEED or to the SAR/SCBA. The valve contains a 0.020-inch orifice that restricts the flow of HP air to 12.2 scfm to reduce stress to the SCBA cylinders. The charging adapter, designed for use when recharging SEED bottles, contains a 0.007-inch screened orifice that further restricts the flow of HP air to 2.0 scfm to reduce stress to the bottle. The shutoff knob on the isolation/bleed valve temporarily stops the flow of air so that cylinders or bottles can be changed out without loss of BARS pressure, and the bleed handle vents excess air from the connection prior to change-out.



SAR / SCBA RECHARGING
(HP AIR SUPPLY HOSE & SAR/SCBA CYLINDERS NOT PROVIDED)



SEED RECHARGING
(HP AIR SUPPLY HOSE & SEED BOTTLE NOT PROVIDED)

Figure 3-1. Major BARS Components and Interrelationships with SAR/SCBA and SEED

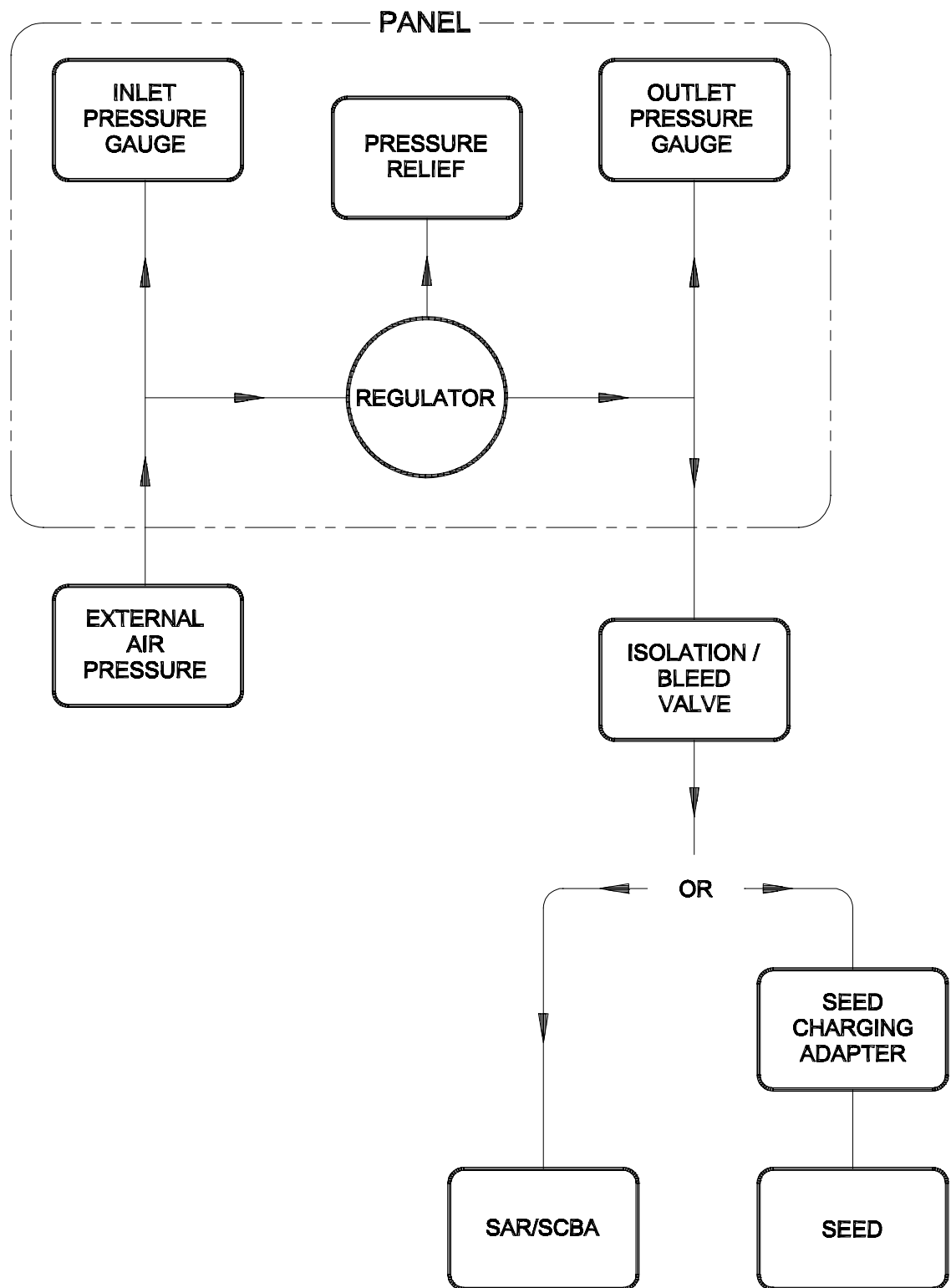


Figure 3-2. BARS Functional Block Diagram

3.2.3 Carrying Case. The hard-shell carrying case contains the panel assembly, hose assembly, charging adapter, and mounting bracket. A thread protector is also included for covering the charging adapter when not in use. Setup, shut-down, and recharging procedures are displayed inside the lid.

3.2.4 Airflow. Figure 3-3 provides a flow diagram showing the direction of airflow within the BARS. The BARS requires the use of an external HP air source capable of supplying breathing air of Grade D or better quality (as defined by CGA G-7.1-1989) at a pressure of $3,000 \pm 50$ psig. The HP air source must also have passed an air sample test within the last three months. When the HP air source is connected and opened, HP air enters the BARS and flows into regulator (AHP-V101) at the pressure indicated on inlet pressure gauge (AHP-G101). The operator-controlled regulator is used to reduce the HP air supply from a maximum pressure of 5,000 psig down to 3,000

± 50 psig as indicated on outlet pressure gauge (AHP-G102). The 3,000 psig air flows through BARS hose assembly (H-101) and into the SCBA cylinders or SEED bottle when the shutoff knob on isolation/bleed valve (AHP-V103) is opened. If multiple cylinders/bottles are recharged, the air-flow is temporarily stopped for change-out using the shutoff knob on AHP-V103. Air is then bled from the connection using the bleed handle on AHP-V103. When the recharging process is complete and the last bottle or cylinder has been safely disconnected from BARS hose assembly (H-101), pressure is bled from the system using the bleed valve on the external HP air supply hose. The airflow reverses at this point and air is drained from the BARS piping and both hoses. The inlet and outlet pressure gauges (AHP-G101 and AHP-G102) reflect the decreasing pressure and register 0 psig when the system is completely depressurized.

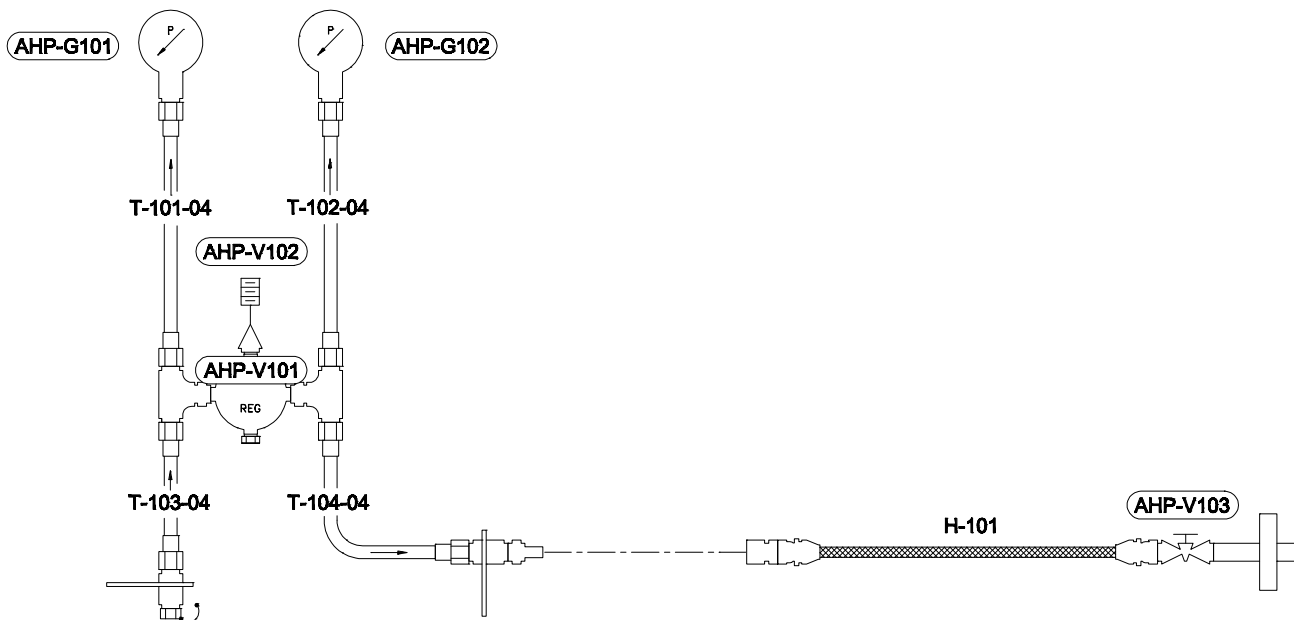


Figure 3-3. BARS Flow Diagram

CHAPTER 4

SCHEDULED MAINTENANCE

WARNING

Properly performed scheduled maintenance is essential to safe and dependable operation of the Breathing Air Reducing Station (BARS). Omission or negligent performance of prescribed maintenance procedures for this equipment could result in equipment failure and injury or death to personnel.

4.1 INTRODUCTION

Proper scheduling and performance of preventive maintenance actions reduces equipment failures and ensures efficient performance of the Breathing Air Reducing Station (BARS). This chapter outlines safety requirements, defines the maintenance concept, references the BARS Planned Maintenance System (PMS), discusses reporting requirements, and provides general maintenance instructions relating to both scheduled and unscheduled (corrective) maintenance actions.

4.2 SCOPE

The preventive maintenance requirements for the BARS are addressed in this chapter to assist supervisors and maintenance personnel in planning, scheduling, and documenting maintenance actions. The information in this chapter supplements the BARS PMS (paragraph 4.5) and is presented in the following sequence:

- a. Safety Requirements
- b. Maintenance Concept
- c. Planned Maintenance System (PMS)
- d. U.S. Navy 3-M System Coverage and Problem Reporting
- e. General Maintenance Instructions

4.3 SAFETY REQUIREMENTS

Maintenance personnel shall read and thoroughly understand the safety precautions contained in this manual and the appropriate Maintenance Requirement Card (MRC) contained in the BARS PMS before performing any maintenance on the BARS. Forces afloat should also comply with the *Navy Occupational Safety and Health (NAVOSH) Program Manual for Forces Afloat*, OPNAVINST 5100.19 series, and shore activities should comply with the *Navy Occupational Safety and Health Program Manual*, OPNAVINST 5100.23 series.

4.4 MAINTENANCE CONCEPT

The BARS maintenance concept is based on the Navy PMS, which classifies maintenance into two categories—scheduled and unscheduled.

4.4.1 Scheduled Maintenance. Scheduled maintenance primarily involves actions required to ensure reliable system operation and includes such actions as inspection, cleaning, lubrication, leak testing, and operational testing. Scheduled maintenance requirements are provided in the BARS PMS (see paragraph 4.5) and are also integrated in the operating procedures located in Chapter 2 of this manual.

4.4.2 Unscheduled Maintenance. Unscheduled (corrective) maintenance includes actions required to locate equipment faults and to correct failures or performance degradations. Unscheduled maintenance actions include troubleshooting and parts replacement and are usually performed by maintenance technicians who are adequately trained in the appropriate service requirements. Unscheduled maintenance is covered in Chapter 5, *Troubleshooting*, and in Chapter 6, *Corrective Maintenance*.

4.5 PLANNED MAINTENANCE SYSTEM (PMS)

The BARS PMS consists of two Maintenance Requirement Cards (MRCs) that are indexed and referenced on Maintenance Index Page (MIP) 6641/004, *Damage Control Petty Officer (DCPO)*. The 18M MRC covers removal of inlet and outlet pressure gauges (AHP-G101 and AHP-G102) for delivery to an Intermediate Maintenance Activity (IMA) for calibration every 18 months or any time gauge inaccuracy is suspected. The 36M MRC covers removal of relief valve (AHP-V102) for delivery to an IMA for testing (and adjustment if necessary) every 36 months or any time valve inaccuracy is suspected. MIP 6641/004 provides a summary of the maintenance actions found on the MRCs, along with periodicity codes, personnel requirements, manhours, and any related maintenance.

4.6 U.S. NAVY 3-M SYSTEM COVERAGE AND PROBLEM REPORTING

The provisions of the *Ships' Maintenance Material Management (3-M) Manual*, OPNAVINST 4790.4 series, apply to the BARS. Accordingly, any problems or need for corrective maintenance arising from performance of the maintenance actions contained in the BARS MRCs should be properly reported using OPNAV Form 4790/2K to ensure timely and accurate Maintenance Data System (MDS) documentation of BARS performance in the Fleet. In addition to Fleet requirements, MDS input from Fleet units is used by the In-Service Engineering Agent (ISEA) to identify and correct problems within the system itself or the related documentation and provisioning, including Coordinated Shipboard Allowance List support. The ISEA may be contacted as follows:

Commanding Officer
Coastal Systems Station, Dahlgren Division
Naval Surface Warfare Center, Code A53
6703 West Highway 98
Panama City, FL 32407-7001

(850) 235-5076 or DSN 436-5076

Naval Message Plain Language Address
Directory (PLAD): NAVSURFWARCEN
COASTSYSTA PANAMA CITY FL //A53//

4.7 GENERAL MAINTENANCE INSTRUCTIONS

WARNING

If in doubt about the serviceability of a part, replace it immediately. Worn or damaged parts shall be replaced with authorized replacement parts only. Component failure during operations may result in serious injury or death.

DO NOT DISASSEMBLE COMPONENTS NOR LOOSEN OR TIGHTEN FITTINGS WHILE THE SYSTEM IS PRESSURIZED. Prior to performing maintenance, ensure HP air supply has been shut down and all pressure has been vented from the system. Exposure to escaping HP air may result in serious injury or death to personnel.

Do not use Trisodium Phosphate (TSP) to clean aluminum components. Use may result in equipment failure and personnel injury or death.

4.7.1 Disassembly and Replacement of Parts.

Disassemble the equipment only to the extent necessary to perform the required scheduled maintenance action. Maintenance authorized at the Organizational and Intermediate levels is specified in the MRCs. Ensure proper tag-out procedures are performed prior to conducting maintenance. If any component fails inspection or testing, replace the worn or damaged part with authorized replacement parts only (see parts lists in Chapter 7). Ensure all replacement parts have been cleaned in accordance with the cleaning process for critical applications provided in MIL-STD-1622, *Cleaning of Shipboard Compressed Air Systems*, using Nonionic Detergent (NID) as the precleaner and Navy Oxygen Cleaner (NOC) as the final cleaner. Approved general cleaning procedures, leak detection compounds, and lubricants are listed in the following paragraphs, along with general O-ring removal and installation procedures. All the tools, parts, and materials used for scheduled maintenance are listed on the individual MRCs and are identified by their Standard PMS Materials Identification Guide (SPMIG) numbers.

WARNING

Cleanliness is imperative in handling and maintaining the BARS. All tools and parts must be kept free of oil, grease, rust, or other contamination. Contamination of the breathing air system could result in serious injury or death to personnel breathing the contaminated air.

4.7.2 General Cleaning Procedure. “Clean” is defined as free of all loose scale, rust, grit, filings, dirt, and other foreign substances when viewed by the unaided eye; and free of oil, grease, and other foreign materials. It is vitally important to keep the work area and parts clean during maintenance of breathing air systems and equipment. To avoid introducing contaminants or foreign particles into joints or connections that need to be opened for maintenance, clean the affected parts with a soft bristle brush and cleaning solution prepared by mixing 1 teaspoon of MIL-D-16791, Type 1 Nonionic Detergent (NID) to 1 gallon of warm, fresh water. Rinse the cleaned parts with clean fresh water and wipe dry with a clean cloth or blow dry. Once joints or connections have been opened, maintain cleanliness by capping or plugging all open ports, or by bagging all exposed components prior to performing maintenance.

4.7.3 Leak Detection. The use of MIL-L-25567, Type 1 leak detection compound is preferred for leak testing all BARS air system connections that were broken for maintenance. The NID solution mentioned in paragraph 4.7.2 may also be used for leak testing if necessary.

4.7.4 Lubrication. For scheduled maintenance, authorized lubricants (if any) are shown on the MRCs. For corrective maintenance, silicone compounds conforming to MIL-S-8660 are authorized for use. Apply lubricants sparingly to avoid clogging or otherwise accumulating foreign matter.

WARNING

Ensure O-rings are in good condition before installation. Failure of an O-ring could cause damage to equipment and injury or death to personnel.

4.7.5 O-ring Removal and Installation. If possible, visually inspect O-rings without removing them to avoid unnecessary disassembly that may cause undue wear. When a maintenance procedure requires that an O-ring be removed and permits its re-use, comply with the removal, inspection, cleaning, lubrication, and installation procedures presented below. Damaged O-rings should be cut and discarded. Installation of new O-rings is covered in paragraph 4.7.5.4.

4.7.5.1 Removal. Do not use screwdrivers or metal picks to remove O-rings. When possible, remove O-rings using fingers only. If an O-ring fits too tightly in its groove to be removed in this manner, use the appropriate tool from an O-ring removal kit. This procedure prevents scratching the O-ring groove, which can cause leakage or premature failure of the seal.

4.7.5.2 Inspection. Inspect all removed O-rings for deformities or compression set, hardening or brittleness, nicks or cuts, pits or blisters, or any other signs of damage. Cut and discard damaged O-rings and replace them with new ones.

4.7.5.3 Cleaning and Lubrication. Strict cleanliness and proper lubrication are extremely important during O-ring installation. Comply with the following to ensure proper installation:

- a. **Ensure all parts are clean throughout the assembly procedure.** Dirt or loose particles in O-ring groove can cause leaks in seal and damage to O-ring, reducing its life. During cleaning of equipment, carefully clean O-ring grooves using soft bristle brush and NID solution prepared in accordance with paragraph 4.7.2.

- b. **Clean used O-rings before reinstalling them.** Place O-rings in a cleaning basin, cover with NID solution prepared in accordance with paragraph 4.7.2, and brush gently with a soft bristle brush. Rinse cleaned O-rings with fresh water and wipe with clean, lint-free cloths. Allow O-rings to air dry.
- c. Before assembly, lubricate O-ring and all parts that contact O-ring. **Apply lubricant sparingly.** Excess lubricant can foul components. Use only approved lubricant for O-rings.
- d. Do not force O-ring over corners, threads, keyways, slots, splines, ports, or other sharp edges. Use thimbles, supports, cones, or similar devices to prevent O-ring from coming in contact with sharp edges.
- e. Ensure O-ring is not pinched at groove corners while closing or assembling components sealed by O-rings.
- f. When assembling component, avoid any rotating and twisting movements that may bunch, cut, or tear O-ring material.

4.7.5.4 Installation. Comply with the following procedures to ensure proper installation of new O-rings or reinstallation of previously used O-rings (if re-use is permitted and the procedures in paragraphs 4.7.5.1 through 4.7.5.3 have been followed).

- a. Ensure that new O-rings are of proper size and material and have been lubricated in accordance with step c of paragraph 4.7.5.3.
- b. Do not overstretch O-ring during assembly. Stretch O-rings only as much as needed for installation. Diameter stretch during installation should not exceed 5 percent; overstretching may damage O-ring.
- c. Ensure O-ring is not twisted in its groove. Twist occurs easily during installation of large O-rings with a relatively small cross-sectional diameter.

4.7.6 Installation of Positionable Fittings. Use the following procedure to install positionable fittings:

- a. Ensure jam nut is positioned against fitting body (turned fully counterclockwise).
- b. Insert positionable fitting into boss, thread until fully clockwise, and then turn counterclockwise until it is aligned with the mating part.
- c. Holding fitting body with a wrench, tighten jam nut (fully clockwise).

CHAPTER 5

TROUBLESHOOTING

5.1 INTRODUCTION

This chapter contains the troubleshooting procedures and data necessary to assist personnel in locating the source of an equipment malfunction or performance degradation in the Breathing Air Reducing Station (BARS). Table 5-1 presents symptoms that may occur during operation of the BARS and suggests probable causes and actions that should correct the problem. Removal and replacement procedures are provided in Chapter 6 of this manual.

5.2 GENERAL INSTRUCTIONS

Troubleshooting is based on locating potential faults in the equipment and taking timely corrective action. This manual cannot possibly list all malfunctions that may occur nor all causes, tests, inspections, or corrective actions that may apply. If a malfunction is not listed or is not remedied by the suggested corrective action(s), notify the supervisor.

Table 5-1. Troubleshooting Guidelines

Symptom	Probable Cause(s)	Corrective Action(s)
Air will not flow	a. External air source depleted, malfunctioning, or not open.	a. Check external air source. Ensure HP air supply hose valve is open.
	b. REGULATOR (AHP-V101) failed.	b. Replace regulator in accordance with (IAW) paragraph 6.6.3.
Air leaks slowly	a. Loose fitting.	a. Ensure system is depressurized. Tighten fitting.
	b. Piping system or component leak.	b. Using MIL-L-25567, Type 1 leak detection compound, perform system tightness test IAW paragraph 6.6.1. Replace components as needed.
	c. O-ring failure.	c. Replace O-ring(s) as needed.
Air leaks rapidly	a. Loose fitting.	a. Ensure system is depressurized. Tighten fitting.
	b. Piping system or component rupture.	b. Using MIL-L-25567, Type 1 leak detection compound, perform system tightness test IAW paragraph 6.6.1. Replace components as needed.
	c. Relief valve (AHP-V102) activated.	c. Replace relief valve IAW paragraph 6.6.4.
REGULATOR (AHP-V101) failed or free-flowing	Failed, contaminated, or defective regulator seat.	Replace regulator IAW paragraph 6.6.3.

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CHAPTER 6

CORRECTIVE MAINTENANCE

WARNING

Properly performed corrective maintenance is essential to safe and dependable operation of the Breathing Air Reducing Station (BARS). Omission or negligent performance of prescribed maintenance procedures for this equipment could result in equipment failure and injury or death to personnel.

6.1 INTRODUCTION

6.1.1 Scope. The corrective maintenance information presented in this chapter includes the actions and procedures required to restore the Breathing Air Reducing Station (BARS) equipment to a fully operable condition. This chapter provides general maintenance information and specific maintenance procedures to assist maintenance personnel in the removal and replacement of inoperative parts or assemblies. The corrective maintenance procedures identify maintenance actions; provide safety precautions; list tools, parts, and materials; and present step-by-step instructions with supporting illustrations. The corrective maintenance procedures in this chapter are provided for qualified maintenance personnel working at the Organizational and Intermediate levels.

The procedures included in this chapter are prescribed in the interest of safety and optimum service life of the equipment; components requiring corrective maintenance beyond the limits described in this document should be sent to the depot facility for repair or overhaul. When a manufacturing defect or recurring malfunction is found, notify the In-Service Engineering Agent at the address shown in Chapter 4, paragraph 4.6.

The information in the remainder of this chapter is arranged in the following sequence:

- a. Safety Requirements
- b. Adjustments and Alignments
- c. General Maintenance Information
- d. Test Equipment and Tools
- e. Consumable Supplies
- f. BARS Corrective Maintenance

6.1.2 Safety Requirements. Prior to performing corrective maintenance on the BARS, maintenance personnel shall review and become thoroughly familiar with the general safety notices and precautions listed in the Safety Summary. Replacement procedures, along with the associated warnings and cautions, shall be read in full prior to beginning corrective maintenance.

6.2 ADJUSTMENTS AND ALIGNMENTS

Gauge calibration and relief valve testing and adjustment are scheduled maintenance actions that are covered by the Maintenance Requirement Cards (MRCs) referenced in Chapter 4, paragraph 4.5. The only adjustment required in this chapter is adjustment of the retaining (jam) nut inside the regulator knob (see paragraph 6.6.3, step c (13)).

6.3 GENERAL MAINTENANCE INFORMATION

WARNING

If in doubt about the serviceability of a part, replace it immediately. Worn or damaged parts shall be replaced with authorized replacement parts only. Component failure during operations may result in serious injury or death.

WARNING

Do not use Trisodium Phosphate (TSP) to clean aluminum components. Use may result in equipment failure and personnel injury or death.

6.3.1 Maintenance Parts. The parts location illustrations referenced in paragraph 6.6 identify the parts affected by the maintenance process. Only approved replacement parts listed in Chapter 7 shall be used in the BARS. Ensure all replacement components have been cleaned in accordance with the cleaning process for critical applications provided in MIL-STD-1622, *Cleaning of Shipboard Compressed Air Systems*, using Nonionic Detergent (NID) as the precleaner and Navy Oxygen Cleaner (NOC) as the final cleaner.

WARNING

Cleanliness is imperative in handling and maintaining the BARS. All tools and parts must be kept free of oil, grease, rust, or other contamination. Contamination of the breathing air system could result in serious injury or death to personnel breathing the contaminated air.

Ensure O-rings are in good condition before installation. Failure of an O-ring could cause damage to equipment and injury or death to personnel.

Ensure proper tag-out procedures are performed prior to conducting maintenance. Failure to comply may result in injury or death to personnel.

WARNING

DO NOT DISASSEMBLE COMPONENTS NOR LOOSEN OR TIGHTEN FITTINGS WHILE THE SYSTEM IS PRESSURIZED. Prior to performing maintenance, ensure HP air supply has been shut down and all pressure has been vented from the system. Exposure to escaping HP air may result in serious injury or death to personnel.

6.3.2 Related Maintenance. Related corrective maintenance actions may include inspection, removal, and replacement of O-rings, as well as inspection and cleaning of component parts. O-ring inspection, removal, and replacement procedures are provided in Chapter 4, paragraph 4.7.5. Unless otherwise directed, all removed O-rings shall be cut and discarded. Also refer to Chapter 4 for specific guidance on installation of positionable fittings, component cleaning procedures and materials, and approved leak detection compounds and lubricants. Ensure cleanliness of the system is maintained at all times in accordance with the requirements in paragraph 4.7.2.

6.4 TEST EQUIPMENT AND TOOLS

No special test equipment is required for corrective maintenance on the BARS. Table 6-1 lists each tool used in this chapter, its National Stock Number (NSN), and the component(s) on which it is used.

6.5 CONSUMABLE SUPPLIES

Table 6-2 lists the consumable supplies needed to perform corrective maintenance on the BARS. The table also includes the NSN for each item and its use.

Table 6-1. Tool List

Tool	NSN	Used On
Kit, O-ring installation and removal	5120-01-021-7381	O-rings
Prying tool	N/A	Regulator knob cover
Ratchet handle, 3/8" drive	5120-01-335-0729	Regulator knob retaining nut
Screwdriver, cross tip, #2 Phillips	5120-00-542-3438	Panel assembly screws
Socket, 1/2" x 3/8" drive	5120-01-335-0906	Regulator knob retaining nut
Wrench, Allen, 5/32"	5120-00-198-5392	Panel mounting bracket screws
Wrench, box/open end, 11/32"	5120-00-278-0342	Gauge nuts
Wrench, open end, 9/16" (& 1/2")	5120-00-187-7124	Gauge fitting; tee nuts; regulator plug
Wrench, open end, 11/16" (& 5/8")	5120-00-277-8301	Tubing assembly nuts
Wrench, open end, 1"	5120-00-203-4812	Relief valve

Table 6-2. Consumable Supplies

Description	NSN	Use
Bag, plastic, 12" x 12"	8105-00-837-7757	Bagging components
Leak detection compound, MIL-L-25567, Type 1	6850-00-186-2963	Performing leak test
Nonionic Detergent (NID) solution, MIL-D-16791, Type 1	7930-00-282-9699	Cleaning components
Sealant, Loctite®, red, MIL-S-22473	8030-00-081-2339	Securing regulator knob
Silicone compound, MIL-S-8660	6850-00-880-7616	Lubricating O-rings
Tag, safety	0105-LF-641-3001	Tagging equipment
Tape, pressure sensitive adhesive	7510-00-582-4772	Sealing bags
Water, clean fresh	N/A	Rinsing components

6.6 **BARS CORRECTIVE MAINTENANCE**

Corrective maintenance of the carrying case and the BARS hose assembly is limited to simple removal and replacement of the affected assembly. Corrective maintenance of the panel assembly, however, is more involved and requires performance of the detailed procedures provided in this section for the removal and replacement of failed components, including the gauges, regulator, and relief valve. The system tightness test, which is performed after every maintenance action, is presented in paragraph 6.6.1.

6.6.1 System Tightness Test. The following test shall be performed after every maintenance procedure to ensure the BARS fittings have been adequately tightened, the replacement parts are functioning properly, and there is no air leakage. The procedures have been written for use with an external high-pressure (HP) air supply with an output pressure of no less than 3,000 and no more than 5,000 pounds per square inch gauge (psig). The purity of the air supply used for testing must be equal to the purity of the air supply used for charging (Grade D or better as defined by CGA G-7.1-1989) and the air supply must have

passed an air sample test conducted within the last three months.

WARNING

a. Tools, Parts, Materials, and Test Equipment:

- (1) Screwdriver, #2 Phillips
- (2) Approved hearing and eye protection
- (3) External HP air supply, Grade D or better, 3,000 – 5,000 psig
- (4) Leak detection compound, MIL-L-25567, Type 1

b. Perform System Tightness Test:

- (1) Remove BARS panel assembly from carrying case in accordance with the following procedure. If panel assembly is already removed for maintenance, perform step (c) only.
 - (a) Using #2 Phillips screwdriver, remove the four retaining screws and washers shown in Figure 6-1.
 - (b) Remove panel assembly from carrying case.
 - (c) Place panel assembly in upright position on clean worktable to allow access to front and back of panel.

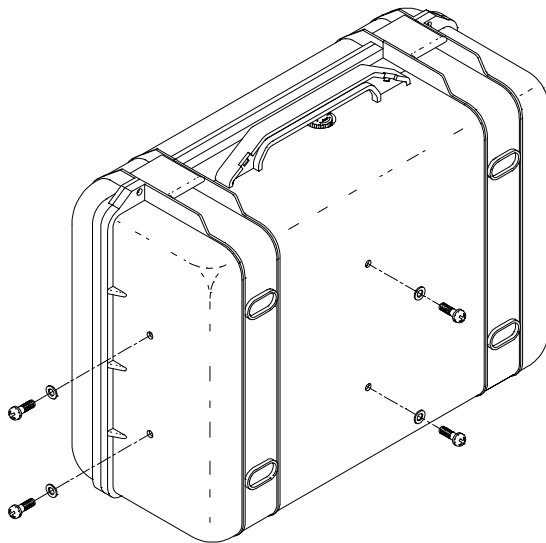


Figure 6-1. Removing BARS Panel Assembly Retaining Screws and Washers

Ensure approved hearing and eye protection is worn when conducting this test. Failure to use protective equipment could result in injury or death.

- (2) Don hearing and eye protection.
- (3) Remove protective caps from HP OUTLET connection and BARS hose assembly (H-101). Connect hose assembly to HP OUTLET.
- (4) Ensure shutoff knob and bleed handle on BARS hose assembly isolation/bleed valve (AHP-V103) are closed (fully clockwise (CW)).
- (5) Remove protective caps from HP INLET connection and external HP air supply hose. Connect HP air supply hose to HP INLET and open external HP air supply at source.
- (6) Ensure bleed handle on external HP air supply hose is closed (fully CW). Slowly open shutoff knob. INLET PRESSURE gauge (AHP-G101) on panel assembly will reflect external HP air supply pressure.
- (7) Adjust REGULATOR (AHP-V101) CW until OUTLET PRESSURE gauge (AHP-G102) reads $3,000 \pm 150$ psig.
- (8) Close shutoff knob on external HP air supply hose.
- (9) Record readings on INLET PRESSURE gauge (AHP-G101) and OUTLET PRESSURE gauge (AHP-G102). Wait 5 minutes, then check and record readings again.
- (10) Compare readings for each gauge. If no difference between initial and 5-minute readings, test is complete (system is not leaking). Proceed to step (12) and shut down system. If pressure drop is noted, continue with step (11).

WARNING

DO NOT LOOSEN OR TIGHTEN FITTINGS WHILE THE SYSTEM IS UNDER PRESSURE. Failure to comply could result in injury or death to personnel and damage to equipment.

- (11) Apply leak detection compound on all joints (front and back of panel), and look for bubbles. If a leak is found, end test by performing steps (12) through (14). Tighten appropriate fitting(s) or perform maintenance procedure for component closest to leak area. Repeat system tightness test until satisfactory results are achieved, then shut down system in accordance with steps (12) through (15).

WARNING

Prior to bleeding pressure from hoses, ensure all personnel are standing clear of area to avoid injury from flying debris. Operator shall announce "Bleeding down" to warn nearby personnel. Operator must wear hearing and eye protection to prevent injury.

- (12) Shut down external HP air supply in accordance with approved operating procedures for system being used. Open bleed valve on external HP air supply hose and bleed air from system until INLET and OUTLET PRESSURE gauges (AHP-G101 and AHP-G102) both read 0 psig. Close bleed valve.
- (13) Back off REGULATOR (AHP-V101) fully counterclockwise (CCW).
- (14) Disconnect external HP air supply hose from HP INLET connection and BARS hose assembly (H-101) from HP OUTLET connection. Install protective caps.

- (15) Insert panel assembly in carrying case. Using #2 Phillips screwdriver, install four panel retaining screws and washers. Stow equipment or continue operations.

6.6.2 Gauge (AHP-G101, AHP-G102) Removal and Replacement. (Numbers in parentheses within text refer to Figure 6-2.)

a. Tools, Parts, Materials, and Test Equipment:

- (1) Kit, O-ring installation and removal
- (2) Screwdriver, #2 Phillips
- (3) Wrench, open end, 11/32"
- (4) Wrench, open end, 9/16"
- (5) Wrench, open end, 11/16"
- (6) Replacement parts: See Chapter 7
- (7) Brush, soft bristle
- (8) Dust caps or plastic bags
- (9) Nonionic Detergent (NID) solution, MIL-D-16791, Type 1
- (10) Silicone compound, MIL-S-8660
- (11) Water, clean fresh

b. Gauge Removal:

WARNING

Before conducting maintenance on the BARS, ensure all pressure has been bled from the system. Failure to comply could result in injury or death to personnel.

- (1) Ensure BARS is depressurized and disconnected from external HP air supply.
- (2) Using #2 Phillips screwdriver, remove four retaining screws and washers from BARS panel assembly (see Figure 6-1), and remove assembly from carrying case. Place panel assembly facedown on clean worktable.
- (3) Using cleaning procedure and materials specified in paragraph 4.7.2, clean area around gauge(s) and tubing.

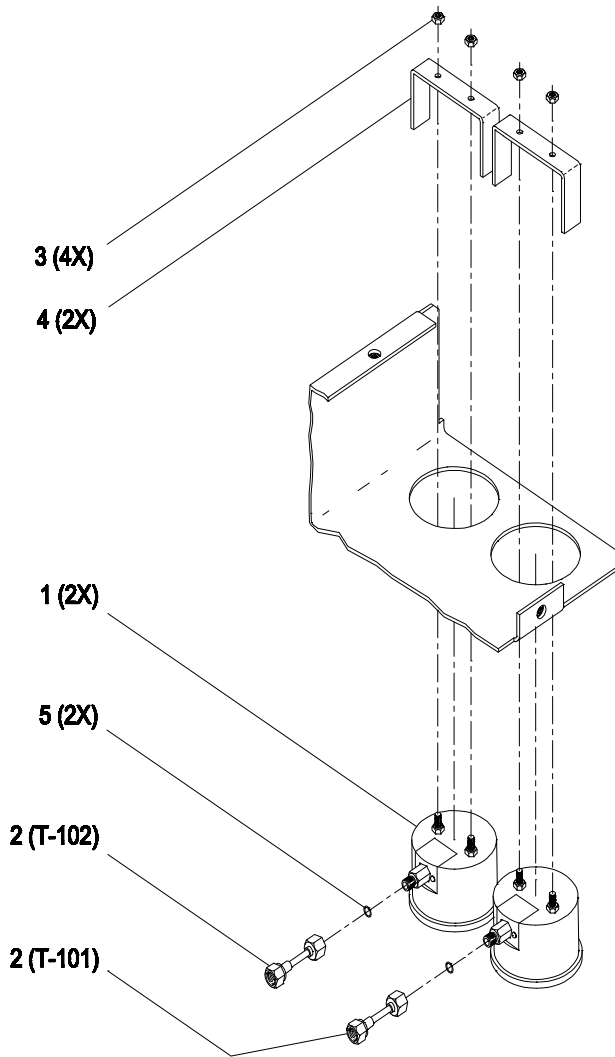


Figure 6-2. Gauge Removal and Replacement

CAUTION

To prevent damage to gauges, use two wrenches when tightening or loosening tubing assemblies.

- (4) Using 9/16" and 11/16" wrenches, hold connection fitting on gauge (Figure 6-2, 1) in place while loosening upper union nut on tubing assembly (2). Slide nut away from gauge fitting.
- (5) Using 11/32" wrench, remove nuts (3) and bracket (4).

- (6) Remove gauge (1) through front of panel assembly.
- (7) Remove, cut, and discard O-ring (5).
- (8) If not replacing components immediately, cap or bag all open components.

c. Gauge Replacement:

NOTE

Ensure replacement gauge has been calibrated and calibration sticker reflects 18-month periodicity.

- (1) Remove protective cap or bag from tubing assembly (2). Using MIL-S-8660, lubricate new O-ring (5) and install on tubing assembly (2).
- (2) Remove protective cap (if any) from connection fitting on new gauge (1).
- (3) Insert gauge (1) through front of panel assembly. Orient gauge so that connection fitting aligns with tubing assembly (2).
- (4) Connect tubing assembly (2) to gauge (1) and hand-tighten fittings.
- (5) Install bracket (4) and nuts (3). Hand-tighten nuts.

CAUTION

To prevent damage to gauges, use two wrenches when tightening or loosening tubing assemblies.

- (6) Using 9/16" and 11/16" wrenches, hold connection fitting on gauge (1) in place while tightening upper union nut on tubing assembly (2).
- (7) Using 11/32" wrench, tighten nuts (3) until bracket (4) is secured. Do not over-tighten.
- (8) Perform system tightness test in accordance with paragraph 6.6.1 and observe

gauge operation. Panel assembly is reinstalled during last step of test procedure.

6.6.3 Regulator (AHP-V101) Removal and Replacement. (Numbers in parentheses within text refer to Figure 6-3, unless otherwise noted.)

a. Tools, Parts, Materials, and Test Equipment:

- (1) Kit, O-ring installation and removal
- (2) Prying tool
- (3) Ratchet handle, 3/8" drive
- (4) Screwdriver, #2 Phillips
- (5) Socket, 1/2" x 3/8" drive
- (6) Wrench, Allen, 5/32"
- (7) Wrench, open end, 9/16"
- (8) Wrench, open end, 11/16"
- (9) Wrench, open end, 1"
- (10) Replacement parts: See Chapter 7
- (11) Brush, soft bristle
- (12) Nonionic Detergent (NID) solution, MIL-D-16791, Type 1
- (13) Sealant, Loctite®, red, MIL-S-22473
- (14) Silicone compound, MIL-S-8660
- (15) Water, clean fresh

b. Regulator Removal:

WARNING

Before conducting maintenance on the BARS, ensure all pressure has been bled from the system. Failure to comply could result in injury or death to personnel.

- (1) Ensure BARS is depressurized and disconnected from external HP air supply.
- (2) Using #2 Phillips screwdriver, remove four retaining screws and washers from BARS panel assembly (see Figure 6-1), and remove assembly from carrying case. Place panel assembly facedown on clean worktable.
- (3) Using cleaning procedure and materials specified in paragraph 4.7.2, clean area around regulator and tubing.

CAUTION

To prevent damage to gauges, use two wrenches when tightening or loosening tubing assemblies.

- (4) Disconnect tubing assemblies (2,5) from gauges (1) in accordance with the following: Using 9/16" and 11/16" wrenches, hold connection fitting on gauge (1) in place while loosening upper union nut on tubing assembly (2 or 5, as appropriate). Slide union nut away from gauge fitting.
 - (5) Using 11/16" wrench, disconnect tubing assemblies (2,3,4,5) from positionable tees (6).
 - (6) Using 11/16" wrench, loosen inlet and outlet tubing assembly nuts (7). Swivel tubing assemblies aside.
 - (7) Using prying tool, remove cover (8) from regulator knob (9). Using socket and ratchet handle, remove retaining nut (10) from inside knob. Turn regulator knob CCW to remove.
 - (8) Using 5/32" Allen wrench, loosen the two hex socket-head screws (11) on panel mounting bracket assembly (12). There is no need to fully remove the screws or the bracket.
 - (9) Remove regulator (13).
- c. Regulator Replacement:
- (1) Using 9/16" wrench, loosen nuts holding the two positionable tees (6) to regulator (13). Remove tees.
 - (2) Using 1" wrench, remove relief valve (14) from regulator (13).
 - (3) Using 9/16" wrench, remove plug (15) from regulator (13).

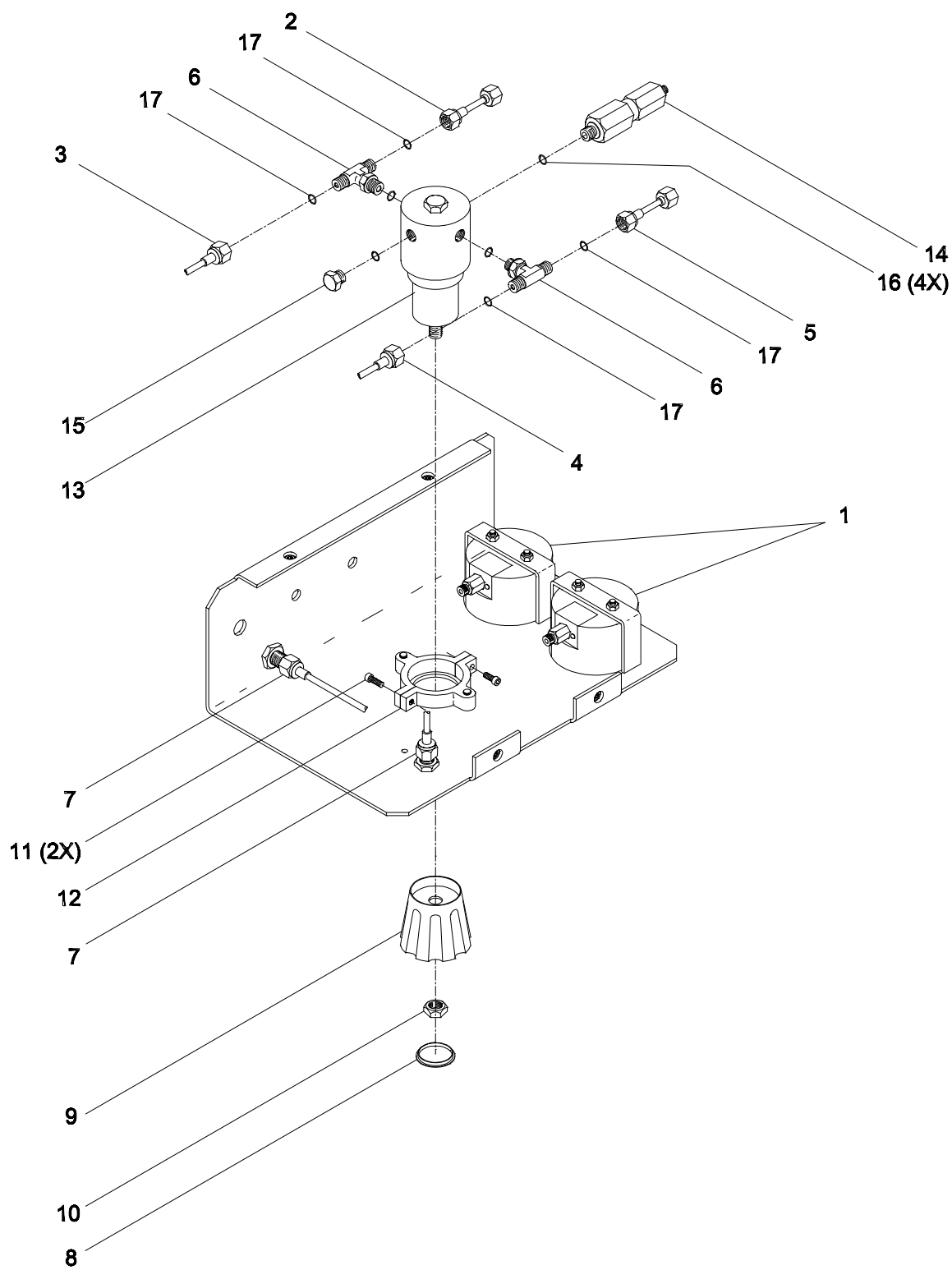


Figure 6-3. Regulator and Relief Valve Removal and Replacement

- (4) Remove O-rings (16,17) from relief valve (14), plug (15), and positionable tees (6). Cut and discard O-rings.
- (5) Using MIL-S-8660, lubricate new O-rings (16,17) and install on relief valve (14), plug (15), and positionable tees (6).
- (6) Using Figure 6-4 as a guide, install the following components into correct ports of new regulator:
 - (a) Using 9/16" wrench, install plug into new regulator.
 - (b) Using 1" wrench, install relief valve into new regulator.
 - (c) Insert positionable tees into new regulator. Thread nuts loosely by hand. Do not tighten.
- (10) Using 5/32" Allen wrench, secure the two hex socket-head screws (11) on panel mounting bracket assembly (12).
- (11) Turn panel assembly over.
- (12) Apply one drop of Loctite® to threads of regulator knob (9), and thread regulator knob onto regulator (13) until it bottoms out.
- (13) Apply one drop of Loctite® to threads of retaining nut (10) and thread nut onto regulator (13). Using socket and ratchet handle, tighten retaining nut against regulator knob (9). Rotate knob to ensure smooth operation; adjust tightness of retaining nut if necessary.
- (14) Snap cover (8) into place on regulator knob (9).
- (15) Using 9/16" wrench, tighten nuts holding positionable tees (6) to regulator (13).

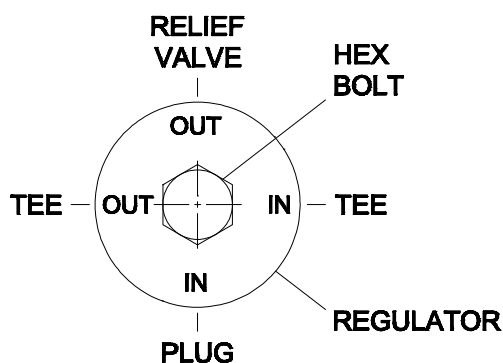


Figure 6-4. Orientation of Components Attached to Regulator (AHP-V101)

- (7) Insert regulator (13) through panel opening as shown in Figure 6-3.
- (8) Inspect upper nut on tubing assemblies (2,5) and ensure O-ring is in place and in good condition. Replace O-ring with new lubricated O-ring if required.
- (9) Loosely thread tubing assembly nuts (2, 3,4,5) onto positionable tees (6). Also thread upper nuts on tubing assemblies (2,5) onto connection fittings of inlet and outlet pressure gauges (1). Do not tighten nuts at this time.
- (16) Tighten connection between gauges (1) and tubing assemblies (2,5) as follows: Using 9/16" and 11/16" wrenches, hold connection fitting on gauge (1) in place while tightening upper nut on tubing assemblies (2 or 5, as appropriate).
- (17) Using 11/16" wrench, tighten connection between tubing assemblies (2,3,4,5) and positionable tees (6).
- (18) Using 11/16" wrench, tighten inlet and outlet tubing assembly nuts (7).
- (19) Perform system tightness test in accordance with paragraph 6.6.1. BARS panel assembly is reinstalled during last step of test procedure.

CAUTION

To prevent damage to gauges, use two wrenches when tightening or loosening tubing assemblies.

6.6.4 Relief Valve (AHP-V102) Removal and Replacement. (Numbers in parentheses within text refer to Figure 6-3.)

a. Tools, Parts, Materials, and Test Equipment:

- (1) Kit, O-ring installation and removal
- (2) Screwdriver, #2 Phillips
- (3) Wrench, open end, 1"
- (4) Replacement parts: See Chapter 7
- (5) Brush, soft bristle
- (6) Nonionic Detergent (NID) solution, MIL-D-16791, Type 1
- (7) Silicone compound, MIL-S-8660
- (8) Water, clean fresh

b. Valve Removal:

WARNING

Before conducting maintenance on the BARS, ensure all pressure has been bled from the system. Failure to comply could result in injury or death to personnel.

- (1) Ensure BARS is depressurized and disconnected from external HP air supply.

- (2) Using #2 Phillips screwdriver, remove four retaining screws and washers from BARS panel assembly (see Figure 6-1), and remove assembly from carrying case. Place panel assembly facedown on clean worktable.

- (3) Using cleaning procedure and materials specified in paragraph 4.7.2, clean area around relief valve.

- (4) Using 1" wrench, remove relief valve (14) from regulator (13). Remove, cut, and discard O-ring (16).

c. Valve Replacement:

- (1) Using MIL-S-8660, lubricate new O-ring (16) and install on new relief valve (14).

- (2) Using 1" wrench, install new relief valve (14) on regulator (13).

- (3) Perform system tightness test in accordance with paragraph 6.6.1. BARS panel assembly is reinstalled during last step of test procedure.

CHAPTER 7

ILLUSTRATED PARTS BREAKDOWN

7.1 INTRODUCTION

This chapter provides the Illustrated Parts Breakdown (IPB) for the Breathing Air Reducing Station (BARS). The IPB consists of Figures 7-1 through 7-3, each containing an exploded view of a major BARS assembly along with an index of parts. Call-outs in the illustrations correspond to the index numbers in the parts list.

7.3 MANUFACTURERS AND SUPPLIERS

Table 7-1 lists the manufacturers and suppliers who provide replacement parts for the BARS. To facilitate the parts ordering process, Commercial And Government Entity (CAGE) codes and complete mailing addresses are provided for each manufacturer/supplier.

7.2 CLEANING OF REPLACEMENT PARTS

Ensure all replacement parts have been cleaned in accordance with the cleaning process for critical applications shown in MIL-STD-1622, *Cleaning of Shipboard Compressed Air Systems*, using Nonionic Detergent (NID) as the precleaner and Navy Oxygen Cleaner (NOC) as the final cleaner.

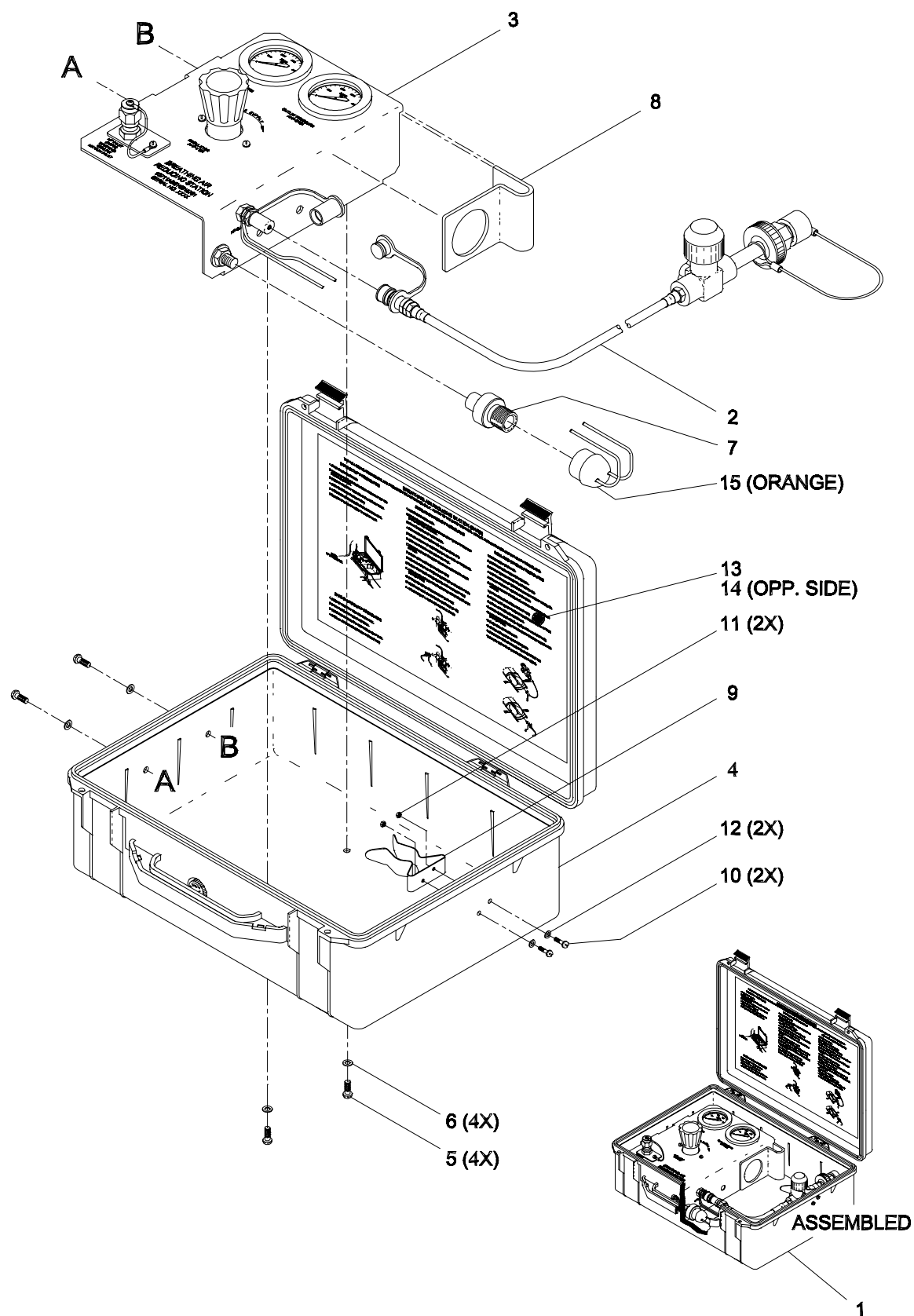


Figure 7-1. Breathing Air Reducing Station (BARS) Assembly (Sheet 1 of 2)

Index No.	Description	Quantity	CAGE Code	Part Number/ Identifying Number
1	Breathing Air Reducing Station Assembly	1	53711	6314781
2	Breathing Air Reducing Station Hose Assembly	1	53711	6314782-1
3	Breathing Air Reducing Station Panel Assembly	1	53711	6314783-1
4	Case, Altered	1	53711	6314784-1
5	Screw, Mach-Pan Head, 0.190-24UNC x 0.50 lg	4	96906	MS51957-63
6	Washer, Flat, 0.190 Nom.	4	96906	MS15795-808
7	Charging Adapter Assembly	1	53711	6314788-2
8	Mounting Bracket	1	53711	6314785
9	Clip, Storage	1	92489	11557-3
10	Screw, Mach-Pan Head, 0.138-32UNC x 0.75 lg	2	96906	MS51957-32
11	Nut, Self Locking, 0.138-32UNC	2	96906	MS17830-06C
12	Washer, Flat, 0.138 Nom.	2	96906	MS15795-805
13	Label, BARS Charging Procedures	1	53711	6314790-1
14	Label, Container (not shown)	1	53711	6314790-2
15	Protector, Thread (specify Orange)	1	N/A *	TS30

* Not available—see American Airworks in Table 7-1.

Figure 7-1. Breathing Air Reducing Station (BARS) Assembly (Sheet 2)

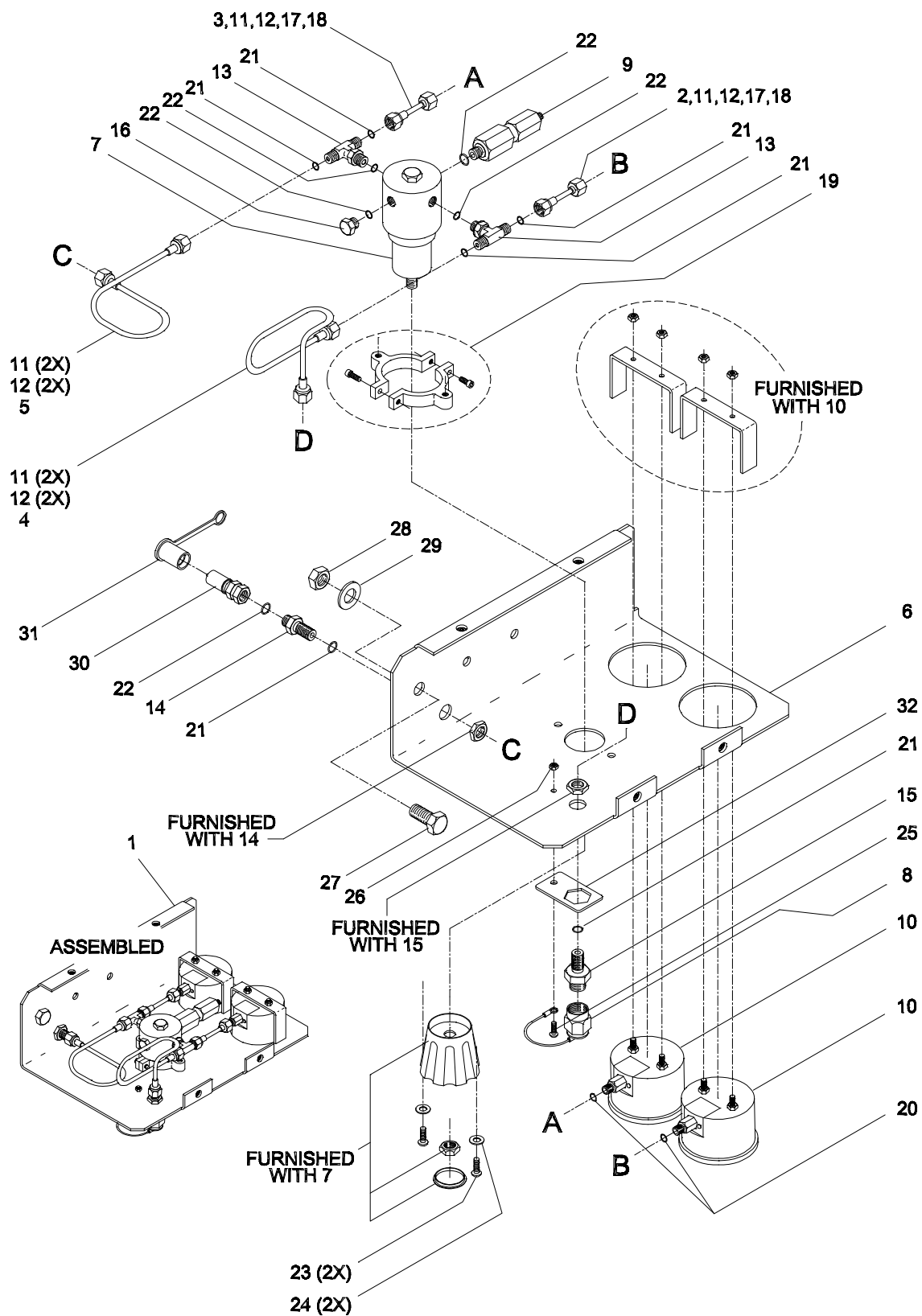
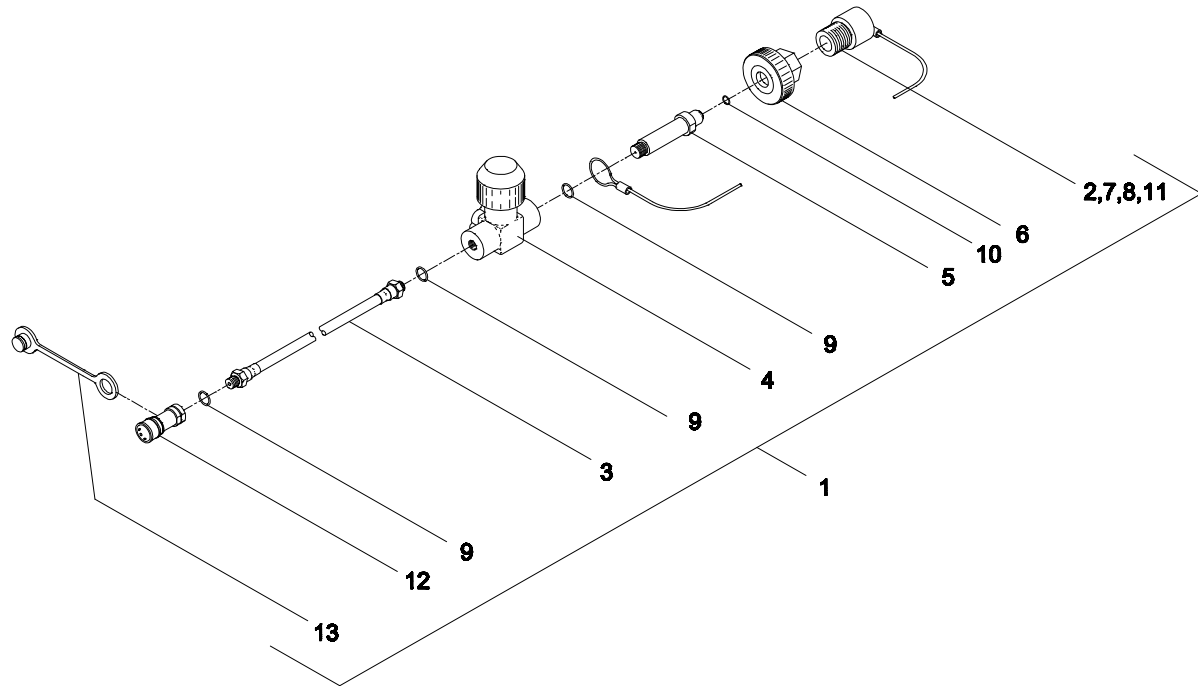


Figure 7-2. BARS Panel Assembly (Sheet 1 of 2)

Index No.	Description	Quantity	CAGE Code	Part Number/ Identifying Number
1	Breathing Air Reducing Station Panel Assembly	1	53711	6314783-1
2	Tubing, T-101	1	53711	6314783-2
3	Tubing, T-102	1	53711	6314783-3
4	Tubing, T-103	1	53711	6314783-4
5	Tubing, T-104	1	53711	6314783-5
6	Breathing Air Reducing Station Panel Subassy	1	53711	6314786-1
7	Regulator (includes knob, nut, cover)	1	33538	269-534-BB4
8	CGA Cap Assembly	1	53711	6314788-1
9	Valve, Relief	1	99565	PLB-12702
10 *	Gauge, Pressure, 0-5000 psi * (includes bracket, nuts)	2	52159	25502-35Y11MCG *
11	Nut, Union, 0.25 Tube	6	11649	SS-4-VCO-4
12	Gland, Socket Weld, 0.25 Tube	6	11649	SS-4-VCO-3
13	Tee, Positionable, 0.25 Tube, VCO to Str Thd	2	11649	SS-4-VCO-TP-4VCO-4ST
14	Bulkhead Union, 0.25 Tube (includes nut)	1	11649	SS-4-VCO-11-4ST
15	Connector, Bulkhead, 0.25 Tube to CGA (includes nut)	1	11649	SS-4-VCO-61-05494
16	Plug	1	08752	4-P50N-SS
17	Nut, Union, 0.25 Tube	2	99565	950-4-SS-304
18	Tailpiece, 0.25 Tube	2	99565	949R-4 SS 316L
19	Panel Mounting Bracket Assembly	1	33538	1129
20	O-Ring	2	81349	M83248/2-008
21	O-Ring	6	81349	M83248/2-010
22	O-Ring	5	81349	M83248/2-904
23	Screw, Mach-Pan Head, 0.250-20UNC x 0.62 lg	2	96906	MS51957-80
24	Washer, Flat, 0.250 Nom.	2	96906	MS15795-852
25	Screw, Mach-Pan Head, 0.190-24UNC x 0.75 lg	1	96906	MS51957-65
26	Nut, Self Locking, 0.190-24UNC	1	96906	MS17830-3C
27	Screw, Cap, Hex Hd, 0.500-20UNF x 1.0 lg	1	96906	MS35308-409
28	Nut, Plain-Hex, 0.500-20UNF	1	96906	MS35650-3394
29	Washer, Flat, 0.500 Nom.	1	96906	MS15795-855
30	Plug, Quick Disconnect	1	73992	ML1-K4-0C-143
31	Plug, Dust Cap	1	73992	P-PDC-1-HK
32	Stop, Antirotational	1	53711	6314791

* Requires calibration sticker showing 18-month periodicity.

Figure 7-2. BARS Panel Assembly (Sheet 2)



Index No.	Description	Quantity	CAGE Code	Part Number/ Identifying Number
1	Breathing Air Reducing Station Hose Assembly	1	53711	6314782-1
2	Plug, CGA	1	53711	7245943-2
3	Hose	1	0ZEC5	T1727-06BK
4	Valve, Line, #4 Female Ports	1	62882	LV3-4ST-KF
5	Nipple, CGA 346	1	53711	6314788-3
6	Nut, Handtight, Altered	1	53711	6314788-4
7	Sleeve, Swaging	1	96906	MS51844-62
8	Lanyard, Altered	1	53711	6314782-2
9	O-Ring	3	81349	M83248/2-904
10	O-Ring	1	81349	M83248/2-010
11	Screw, Drive, #8 x 0.38 lg	1	39428	91654A192
12	Socket, Quick Disconnect	1	73992	ML1-H4-0C-143
13	Socket, Dust Cap	1	73992	P-SDC-1-HK

Figure 7-3. BARS Hose Assembly (H-101)

Table 7-1. List of Manufacturers and Suppliers

CAGE Code	Manufacturer/Address
0ZEC5	CAPITAL RUBBER & INDUSTRIAL SUPPLY 130 PROGRESS DR TALLAHASSEE, FL 32304
08752	PARKER HANNIFIN CORP 17325 EUCLID AVE CLEVELAND, OH 44112
11649	CAJON CO 9760 SHEPARD RD MACEDONIA, OH 44056-1124
16166*	WESTERN ENTERPRISES 33672 PIN OAK PKWY AVON LAKE, OH 44012-2322
33538	TESCOM CORP INSTRUMENT DIV 12616 INDUSTRIAL BLVD ELK RIVER, MN 55330-2445
39428	MCMaster-CARR SUPPLY CO 600 COUNTRY LINE RD ELMHURST, IL 60126-2034
46384*	PENN ENGINEERING & MFG CORP 5190 OLD EASTON HWY DANBORO, PA 18916
52159	3-D INSTRUMENTS INC 15542 CHEMICAL LANE HUNTINGTON BEACH, CA 92649-1505
53711	NAVAL SEA SYSTEMS COMMAND WASHINGTON, DC 20362
62882	INFLATION SYSTEMS INC 500 OGDEN AVE MAMARONECK, NY 10543
65442*	PELICAN PRODUCTS INC 23215 EARLY AVE TORRANCE, CA 90505-4002
73992	TUTHILL CORP HANSEN COUPLING DIV 1000 W BAGLEY RD PO BOX 805 BEREA, OH 44017-0805

* Manufacturer is referenced in drawing package but not in this manual.

Table 7-1. List of Manufacturers and Suppliers—Continued

CAGE Code	Manufacturer/Address
81349	MILITARY SPECIFICATION
84256*	AVIBANK MFG INC 210 SOUTH VICTORY BLVD BURBANK, CA 91503
92489	ATTWOOD CORP 1016 MONROE AVE LOWELL, MI 49331-1167
92555*	THE LEE CO 2 PETTIPAUG RD WESTBROOK, CT 06498-1591
96906	MILITARY STANDARD
99565	CPV MANUFACTURING INC 851 N PRESTON ST PHILADELPHIA, PA 19104-1563
N/A	AMERICAN AIRWORKS 209 E MAIN ST SOPHIA, WV 25921

* Manufacturer is referenced in drawing package but not in this manual.

CHAPTER 8

INSTALLATION

8.1 INTRODUCTION

This chapter provides instructions for unpacking, inventorying, inspecting, storing, and shipping the Breathing Air Reducing Station (BARS). No special installation procedures are required.

8.2 UNPACKING AND INVENTORY PROCEDURES

8.2.1 Unpacking. Upon receipt of the shipping crate, unpack the BARS carrying case. Use care to avoid damaging the gauges during the unpacking procedure.

8.2.2 Inventory. Inventory the components to ensure receipt of all equipment. Verify that the equipment serial numbers correspond to those on the packing list.

8.3 INSPECTION PROCEDURE

Perform a thorough inspection for damage and manufacturing defects, including missing parts, faulty workmanship, dirt, cracks, corrosion, or deterioration. Report damage, defects, or deficiencies to the supply or transportation department. If any BARS component is damaged or defective, the BARS should not be placed in service until the problem has been corrected. Inspect the BARS as follows:

- a. Inspect carrying case for cracks, dents, or other damage. Open and close case to ensure proper operation of hinges and locking tabs. Inspect handle for any signs of damage.
- b. Inspect panel assembly as follows to ensure that all controls and indicators are in good operating condition:
 - (1) Check panel for signs of structural damage, such as dents or cracks.

- (2) Ensure regulator knob is not missing or broken. Rotate knob to ensure smooth and proper operation.
- (3) Check gauges for visible damage.
- (4) Ensure gauge calibration stickers show current calibration dates.
- (5) Inspect components for loose, damaged, or missing nuts and screws.
- (6) Ensure protective caps and lanyards are in place on inlet and outlet ports.

- c. Remove BARS hose assembly (H-101) from storage clip and inspect assembly for cuts, tears, or other damage. Check operation of quick-disconnect socket. Rotate shutoff knob and bleed handle on BARS hose assembly isolation/bleed valve (AHP-V103) to ensure proper operation. Ensure protective caps and lanyards are in place. Ensure storage clip is securely attached to case.
- d. Ensure mounting bracket, charging adapter, and thread protector are present and in good condition.

8.4 STORAGE PROCEDURE

Ensure the BARS is clean and dry prior to storage. If necessary, clean the accessible surfaces with a warm Nonionic Detergent (NID) solution prepared in accordance with paragraph 4.7.2, then thoroughly rinse and dry components. Stow any loose components and store the case in a clean, dry location. Avoid storing the equipment in direct sunlight or near a potential heat source or flammable materials.

8.5 SHIPPING PROCEDURE

Specific shipping procedures can be obtained from the unit's supply/transportation department.

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